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Teacher Professional Development on Differentiated Instruction: designing and implementing a professional development program for Greek public EFL secondary school teachers on differentiated instruction using the Learning by Design knowledge processes.

PhD dissertation

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Abstract

This study synthesized diverse research in the field of learning and teacher education in an attempt to explore what makes effective Teacher Professional Development (TPD) for Differentiated Instruction (DI). The result of the study's original research syntheses involving the nature of DI, the necessary teacher competences, and the processes and conditions required for TPD on DI has been Exploring DI Together (EDIT), an online polyvocal transformative TPD program on DI using the Learning by Design (LbD) knowledge processes and grounded on the formation of an online asynchronous Community of Practice (CoP) of eleven Greek English as a Foreign Language (EFL) teachers. The ultimate aim of the program was teacher change building on transformative, differentiated and situated learning principles. The research design was that of an evaluative case study insider research. The data were collected from three questionnaires given at the beginning, in the middle, and the end of EDIT, and the learning elements the participants designed at the beginning and the end of the program. The findings of the descriptive statistical analysis and the qualitative and quantitative content analysis triangulated describing: a) EDIT as an inherently transformative intrinsically motivating program with a thoroughly planned meaningful curriculum focusing on understanding with frustrating time aspects and a developing online asynchronous community, b) teacher developing openness to diversity after EDIT exhibiting raised awareness of student diversity and assuming more responsibility for their learners' learning, and c) teacher developed ability to design semi or high quality differentiated lesson plans. In conclusion, the study makes important contributions at the level of theory, research and practice in the area of TPD on DI.

Περίληψη

Η έρευνα αποτελεί βιβλιογραφική σύνθεση από το χώρο της μάθησης και της εκπαίδευσης εκπαιδευτικών σε μια προσπάθεια να εξερευνήσει το ερώτημα τί συνιστά αποτελεσματική επαγγελματική εκπαίδευση εκπαιδευτικών για τη διαφοροποιημένη διδασκαλία. Το αποτέλεσμα αυτής της πρωτότυπης ερευνητικής σύνθεσης είναι το Exploring DI Together (EDIT), ένα εξ αποστάσεως διαφοροποιημένο μετασχηματιστικό πρόγραμμα επαγγελματικής εκπαίδευσης εκπαιδευτικών για τη διαφοροποιημένη διδασκαλία που χρησιμοποιεί τις γνωστικές διαδικασίες της Μάθησης μέσω Σχεδιασμού (LbD) και στηρίζεται στο σχηματισμό μια εξ αποστάσεως ασύγχρονης Κοινότητας Πρακτικής (CoP) έντεκα Ελλήνων καθηγητών της Αγγλικής ως Ξένης Γλώσσας (EFL). Το πρόγραμμα βασίζεται στις αρχές της μετασχηματιστική,

της διαφοροποιημένης μάθησης και της μάθησης μέσω κοινοτήτων πρακτικής και ο τελικός σκοπός του ήταν η αλλαγή στάσης των καθηγητών. Είναι αξιολογική μελέτη περίπτωσης και η συλλογή των δεδομένων έγινε με τρία ερωτηματολόγια στην αρχή, στη μέση και στο τέλος του EDIT, και τα σχέδια μαθήματος που σχεδίασαν οι καθηγητές στην αρχή και στο τέλος του προγράμματος. Χρησιμοποιήθηκε τριγωνοποίηση των αποτελεσμάτων της περιγραφικής στατιστικής ανάλυσης των αποτελεσμάτων της ποσοτικής και ποιοτικής ανάλυσης περιεχομένου, η οποία έδειξε: α) το EDIT ως ένα εγγενώς μετασχηματιστικό και σχολαστικά σχεδιασμένο πρόγραμμα σπουδών εστιασμένο στην κατανόηση, το οποίο κινητοποίησε εσωτερικά τους συμμετέχοντες μια αναπτυσσόμενης κοινότητας με πιεστικά χρονικά χαρακτηριστικά, β) μια αναπτυσσόμενη ανοικτότητα των καθηγητών προς τη διαφορετικότητα μετά το EDIT επιδεικνύοντας αυξημένη επίγνωση της διαφορετικότητας των μαθητών και αναλαμβάνοντας μεγαλύτερη ευθύνη για τη μάθηση των μαθητών τους, και γ) την ανάπτυξη της ικανότητας των καθηγητών να σχεδιάζουν υψηλής ή μέτριας ποιότητας διαφοροποιημένα σχέδια μαθήματος. Συμπερασματικά, η έρευνα αποτελεί σημαντική συνεισφορά στο χώρο της επαγγελματικής εκπαίδευσης εκπαιδευτικών για τη διαφοροποιημένη διδασκαλία σε επίπεδο θεωρίας, έρευνας και πρακτικής εφαρμογής.

Contents

Chapter 3: Learning by Design: a Tool for Designing High-Quality Differentiated Curriculums

Chapter 4: Teacher Professional Development on Differentiated Instruction

Chapter 6: Research Methodology and Design

Chapter 7: Teachers' Perceptions of their Experience with EDIT

Chapter 10: Discussion

List of Figures

List of Tables

Chapter 1

Introduction

1.2 The context of the research: demands for inclusive, equitable, quality education

The broader context of this research is informed by core global demands for inclusive and equitable quality education for all. For instance, the worldwide movement of *Education for All* led to the adoption of the Incheon Declaration for Education 2030, an important global education policy document, which sets out a new vision for education for the next fifteen years and describes the framework for action for the implementation of a number of policies so as to ensure *inclusive* and *equitable quality education* for all. In that respect, the European Commission has attempted to rethink education acknowledging that modern day challenges call for high teacher competence to handle complexity and adapt to the needs of individual learners and groups (EU, 2012; Rethink Education). A core facet of modern teacher expertise is recognized to be '*individualization*' referring to the knowledge, skills and attitudes that teachers must acquire in order to deal with inclusion and diversity through the application of a multi-perspective pedagogy which will appreciate student difference (Prengel, 1995 in EU, 2013). It is, thus, currently recognized that the quality of the teachers is instrumental to effective learning of each and every learner (Hargreaves, 2016; Darling-Hammond, 2012; EU, 2005; EU, 2012; OECD, 2016). This need for a more effective teacher education and teachers' career long professional development is officially accentuated recognizing that *high quality learning of each and every learner is inherently bound to high quality teaching* (EU, 2012; EU, 2013). In particular, EU (2012, p.6) writes:

> *Developing the competences of teaching staff and school leaders, including those who have been in the profession for a long time, is a continuing and increasingly urgent priority in all Member States.*

This research is situated within the Greek educational context, a traditionally

nationally oriented field of policy and practice (Sarakinioti & Tsatsaroni, 2015). Greece acknowledged for the first time the fact that each learner is different and that individual differences must be taken into account for effective learning in the national Cross-thematic Curriculum in 2003 (DEPPS, 2003). In 2009, the Greek Ministry of Education attempted to reform education through the introduction of the 'New School – Student First' curriculum reform initiative. The rationale of the new curriculum adopted the rhetoric of contemporary political discourse on education (Ministry of Education, 2009) implicitly adopting a New Learning approach to education (Kalantzis and Cope,2004 ; Paidagogiko Institouto, 2012). This approach starts with a transformative vision, the vision of the school of the 21st century aspiring to create a school that will manage to respond to the new demanding educational needs and challenges of the 21st century (Paidagogiko Institouto, 2012). Within that context, the Integrated Foreign Languages Curriculum, which became official in September 2016, emphasized the importance of differentiated instruction (DI) as an effective pedagogy for classroom diversity (Mavroudi, 2017).

In the case of English as a foreign language (EFL), the need for differentiated instruction (see 1.2) for students to experience successful and meaningful language learning is particularly highlighted due to the mixed-ability nature of English classes, which have students of various language proficiency levels (Ortega et al., 2018; Baker, 2002 in Naka, 2018; Vodopija-Krstanović & Pajalić, 2016). It is characteristic that in Greece, where English is widely used for international communication and employment, English is taught as a compulsory subject in primary and secondary education, while at the same time the majority of language learners attend private lessons in language institutes or one-to-one tuition (Tzanni, 2018; Institouto Ekpaideutikis Politikis, 2012). This parallel attendance of foreign language classes both in the private and the public sector contributes greatly to an exacerbation of student diversity within the same class.

Within that context, the 'New School – Student First' Greek curriculum reform initiative describes Greek teachers' role as that of autonomous high-skilled professionals who are responsible of diagnosing learner needs and designing the

appropriate learning experiences to address their learners' particular needs within the particular sociocultural context of the particular school community and in collaboration with other teachers (Ministry of Education, 2009). That is why, the development and the implementation of the New Curricula has been so central in the New School reform. The New Curricula have been designed as tools to facilitate teachers in their new role by clearly identifying and explicitly stating what is essential for learners to learn leaving enough space for teacher initiative and flexibility following the principles of New School and New Learning. To this purpose, teacher professional development is considered important.

1.2. Differentiated instruction: a core pedagogy for inclusive and equitable education

Differentiated instruction is deemed as a useful inclusive teaching approach because it takes into consideration the individual characteristics of all learners (see Strogilos, 2018; Lawrence-Brown, 2004; Santamaria, 2009). DI as a way of teaching that acknowledges the importance of each student's unique characteristics and needs originated in the field of special education and particularly the field of gifted education (Santamaria, 2009). Gifted education relied heavily on research results of cognitive psychology so as to develop instructional principles and practices that could facilitate learners excel and fulfill their potential through learning in relation to their individual learner needs. Tomlinson and Callahan (1992, p.185) write:

> *For nearly half a century, writers and practitioners in the field of instruction for the gifted have studied, described, applied and evaluated the kind of cognitively based instruction which is now being recommended broadly for all students…..In fact, it is likely that gifted education is the oldest, best laboratory and model for cognitive-based education which exists in American public education today. (Tomlinson and Callahan, 1992: p.185)*

Over time, DI serving the purposes of inclusive education has evolved from gifted education to supporting the inclusion of Special Educational Needs (SEN) students in

mainstream classrooms and, more recently, to teaching *all* leaners, where wide range of learner diversity is acknowledged from students' different cultural, linguistic, academic, and socioeconomic background to their diverse interests and learning profiles (Tomlinson, 1992, 1995, 2001; Santamaria, 2009; Huebner, 2010; Strogilos, 2018).

As Subban (2006, p.938) claims 'the use of one-size-fits-all curriculum no longer meets the needs of the majority of learners' and ignoring those 'may result in some students falling behind, losing motivation and failing to succeed'. Thus, DI is underlain by a new conceptualization of equity which sees the practice of teaching all learners the same thing, in the same way, over the same time span as deeply damaging and inherently 'unfair' to the wide spectrum of different learner needs (Tomlinson, 1995). Instead, equity is found in differentiated instruction which recognizes that learners have different learning needs and takes enough care to provide equal opportunities for growth and quality learning to all those learners no matter what their different starting points are.

It is important to note that Tomlinson (2001) distinguishes DI from individualized instruction arguing that DI aims to teach each and every individual child within a classroom, but it is not individualized instruction, where teachers must determine the style and needs of each single learner before start planning their lessons. Contrary to individualized instruction, in DI teachers proactively plan their teaching assuming that different learners have different learning needs. Thus, their main aim is to offer several different avenues to learning maximizing the chances that each learner will find that way an appropriate fit to their different needs. Otherwise, aiming to plan and teach for each individual child within a classroom, as it was expected in the individualized instruction of the 1970's, would not only exhaust teachers but it would also result in fragmented learning (Tomlinson, 2001). Important tools in the process of differentiating instruction effectively are considered constant teacher monitoring of learning during instruction, the use of formative assessment and flexible grouping configurations.

1.3. The problem with differentiated instruction

Researchers and policymakers call for the implementation of differentiated instruction in classrooms so as to address all students' needs and help them grow to their full potential (Ainscow, 2020; Shareefa & Moosa, 2020; Bogen et al, 2019; Strogilos, 2018; Subban, 2006; Lawrence-Brown, 2004; Tomlinson, 2000; OECD, 2012; Paidagogiko Institouto, 2012; UNESCO, 2004). Yet, for the practitioners it remains a challenging and often impossible task that of translating DI principles into practice. A gap exists between societal and pedagogical demands for a multi-perspective, differentiated pedagogy, and teacher readiness in implementing it. This gap has been reported in half of the European countries surveyed by the European Commission (2012). In particular, teachers, among whom Greek teachers as well feel that they require more professional development. The areas, in which they experience the greatest lack of necessary skills and competences, are among others teaching for diversity in the classroom and working with special needs children (EU, 2012). Many teachers who teach at schools nowadays, however, attended their initial education courses at a time when knowledge about knowledge and learning was less developed and most narrowly-conceived (EU, 2012). It is important to stress that these teachers have been taught both as students themselves and teachers later to a different learning paradigm, that of didactic education, and experience great difficulty to make the paradigm shift to a learner centered education (Scweisfurth, 2016).

On the other hand, research on teacher's professional development on differentiation is poor. A limited number of qualitative case studies show that teaching in response to learners' diverse needs is indeed challenging and teachers need support, experience, model examples of how differentiation is implemented in the classroom and time to develop the appropriate skills (Lewis & Batts, 2005; Kornhaber et al, 2004; Tomlinson, 1995). Nevertheless, there are no data that actually indicate the precise formula that teacher professional development programs on DI should follow (Dixon et al. 2014). Furthermore, there is scarce attention in research on teacher professional development alone - irrespective to differentiation. It is indicative that the current discourse on teaching and teacher education is greatly driven by global and European

pressures to quality education motivated mainly by political and ideological concerns rather than a thorough understanding of teacher's work or teacher professional development (Calderhead and Shorrok, 1997). Accordingly, OECD (2016. p.27) acknowledges that 'more than two decades into the move to professionalise teaching, a thorough understanding is still lacking of what teacher professionalism looks like in different contexts and how teacher professionalism is related to outcomes of interest'.

At the beginning of the 1990's, Fullan and Hargreaves (1992) openly reflect on how little systematic attention had been given to the understanding of teacher development in relation to educational change. And they go on to express their belief that even though it was starting to become the agenda of the decade, it would be unlikely to receive the systematic and deep attention it required. A decade later, a systematic review of teacher education research in the UK from 2000 to 2008 reveals that issues of 'equity', 'ethics' and 'teacher educators' professional development' appear to be at the periphery of research interests (Sarakinioti and Tsatsaroni, 2015). Korthagen (2017) expresses his amazement that for quite a long time, there has been so little research on teacher learning, especially if one takes into account the many failing attempts at influencing teacher behavior. In the same line, Schalock et al. (2006) write about the need to 'scale-up' research on teacher education admitting that the current teacher education research base has little to say about how to prepare high performing teachers. What all these add up to is a field, which is full of misunderstandings and with much debate about what quality teaching looks like and what is the best way to professionalise teachers (Hargreaves, 2016).

1.4. The purpose of this research and its methodology

This research constitutes an in-depth exploration of what makes an effective teacher professional development program on DI. For the purposes of this study, the theoretical propositions drawn from the literature (see below chapters 2, 3 & 4) were translated into action in the design, implementation and testing of a yearly differentiated online teacher professional development program on DI, called

Exploring DI Together (EDIT) (see Fig. 1.2 & chapter 5) within a Greek context of 11 EFL secondary-school teachers. The program took place through the online medium of the Scholar platform (https://cgscholar.com) in a series of four Learning by Design (Kalantzis and Cope, 2004) cycles from October 2016 to November 2017. EDIT followed an explicit program logic linking outcomes with program activities and processes and the theoretical assumptions of the study (W.K. Kellogg Foundation, 2004). In short, EDIT adopted a **polyvocal transformative learning** approach for teachers' training on differentiated instruction using the Learning by Design knowledge processes in the context of an online Community of Practice setting the following transformative, meaningful learning and affective aims:

a) teacher mindset change from non-openness to openness to diversity

b) developing teacher ability to design high-quality differentiated learning elements

c) addressing teacher basic affective needs for competence, autonomy and sense of belonging.

This PhD study tested EDIT's effectiveness in achieving the aims it sets by following an evaluative case study research design in the context of an insider research. The research questions guiding the case study were:

1. How did teachers perceive the experience of EDIT, an online differentiated TPD program on DI?

2. How effective has EDIT been in transforming teachers' mindsets?

3. What effect has EDIT had on teachers' ability to design high-quality differentiated learning elements?

The study used both quantitative and qualitative data for answering the research questions. The ultimate aim of the EDIT evaluative case study was to test the theoretical propositions underlying EDIT and the instructional tools it employed so as

The **EDIT** program

Resources	Activities	Content	Output	Outcomes
PhD researcher was the teacher educator & designer of EDIT 11 English as a Foreign Language secondary school teachers From October 2016 to November 2017 Online medium: the Scholar platform Material & curriculum designed using the Learning by Design & the Understanding by Design curriculum design models	o Focusing on essential knowledge o Experiencing the Known o Experiencing the New o Conceptualizing by Naming o Conceptualizing by Theory o Analyzing Functionally o Analyzing Critically o Multimodal meaning representations o Hearing alternative perspectives o Negotiating different perspectives o Collaborating, working together o Experiencing emotional support o Sharing of resources and knowledge o The teacher educator as a collaborative learner	Cycle 1: multimodal material on core intercultural concepts such as stereotypes, perspective Cycle 2: multimodal material on core growth & fixed mindset concepts Cycle 3: multimodal material on core concepts such as core concepts, higher-order thinking, Bloom's taxonomy, Understanding by Design s Cycle 4: multimodal material on core multiple learning pathways concepts such as multiliteracies, the Learning by Design knowledge processes	Development of teacher intrinsic motivation: satisfaction of their basic affective needs for competence, autonomy, a sense of belonging Teachers designed & implemented in their classrooms one-hour lessons about intercultural, growth & fixed mindset concepts (end of 1st & 2nd cycles) Teachers designed & implemented in their classrooms one-hour lessons using meaningful learning principles & employing multiple learning pathways (end of 3rd & 4th cycles) Teachers designed & implemented in their classrooms high-quality differentiated learning elements (end of EDIT)	Teachers becoming more open to diversity developing • intercultural attitudes • reflective behavior • growth-mindset Teachers developing the ability to design high-quality differentiated learning elements • meaningful learning • responding to learner diversity

Assumptions underlying the program:
Teacher resistance to change into a learner-centered education due to the implicit predominant 'training' model assumptions about professional learning, where learning equals knowledge transmission in univocal learning pathways allowing for no critical examination and critique (Webster-Wright, 2009) asks for polyvocal transformative teacher professional development on differentiation employing transformative learning (Mezirow, 1996; 1997), differentiated instruction (this PhD literature synthesis) and situated learning (Wenger et al, 2011) processes and conditions. The tools used for the design of EDIT as a meaningful differentiated curriculum were Learning by Design (Kalantzis and Cope, 2004), a polyvocal pedagogy of knowledge processes, and Understanding by Design (Grant Wiggins and Jay McTighe, 2005), focusing learning on essential knowledge. The asynchronous online learning nature of the program provides a flexible mode of access for teachers comfortably fitting their personal circumstances (Macia and Garcia, 2016).

Figure 1.1. This figure depicts a graphic representation of the EDIT program relationships among its assumptions, resources, activities, content, output and expected outcomes.

to generate new knowledge and understandings of what makes an effective TPD program on DI.

1.5. The theoretical underpinnings of this research intervention and a model for action

Literature reviews (Bondie et al., 2019; van Geel et al., 2019) revealed gaps in the theoretical framing of differentiated instruction and acknowledged the need to shift the focus from superficial aspects of DI such as the use or nonuse of certain materials and activities to the underlying processes of effective differentiation. In accordance, this study proposes a theoretical reframing of DI starting with the definition of learner diversity by synthesizing Kalantzis and Cope's (2016) perspective on human differences, which pivots around the concept of 'a learner's lifeworld', and Tomlinson's (2001) three more cognitive identified learner differences, i.e. learner readiness, interest, and learning profile.   In addition, the literature review has led to the original synthesis by the researcher of a DI model to underpin this investigation framed along the following three distinct hierarchical DI levels (see Fig.1.2), which build on each other,

  a) the affective level,
  b) the planning level, and
  c) the instructional level

This study focuses on the first two levels of the DI pyramid, which are considered foundational for any introductory TPD program on DI. The first differentiation level delineates its affective nature, which has been greatly overlooked by relevant research. The identification and exploration of this level draws on scarce and mainly unconnected research. Starting from Tomlinson and Imbeau's (2012) acknowledgment that a set of beliefs underlie the affective nature of differentiation, this study builds on Kumar and Hamer's (2012) construct of *teacher openness to diversity* for the identification of the set of specific beliefs and attitudes that constitute the affective level of DI. It is, thus, purported that *an open to diversity teacher* mindset involves a) teacher intercultural attitudes and reflective behaviour (Kumar & Hamer,

2012; Epley, 2014; Byram, 1997), and b) a growth mindset with respect to both students and teachers (Dweck, 1999; 2012). Apart from teacher openness to diversity, the affective level of differentiation is also underlain by another important affective aspect, which pertains to student feelings and emotions, and it refers to the creation of the appropriate affective conditions from an autonomy-supportive teacher for *the development of learners' intrinsic motivation* for learning (Reeve, 2009; Krapp, 1999; 2005).

This PhD Research Differentiated Instruction Pyramid
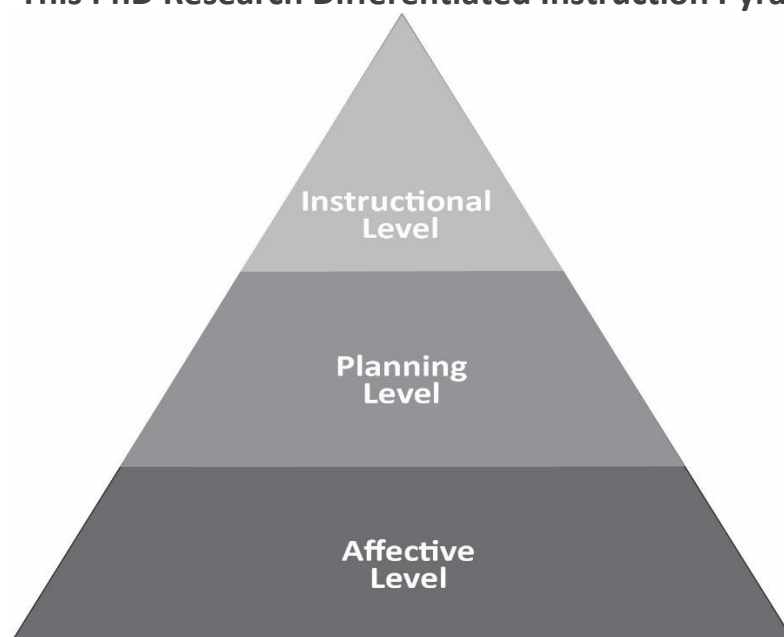
Figure 1.2. The figure depicts this PhD research synthesis from the literature reviewed of differentiated instruction as a three-level pyramid.

The second level of the DI pyramid is identified to be the design of high-quality differentiated learning elements. A learning element is defined as a sequence of knowledge movements which constitute a complete pedagogical unit with a beginning, middle and end (Kalantzis & Cope, 2004). Designing of high-quality learning elements is referred by Tomlinson (1999; 2000) as a necessary condition for effective differentiation, while van Geel et al. (2019) and Bondie et al.'s (2019) research acknowledge planning according to meaningful learning principles as a necessary stage for DI before instruction.

Further review of the relevant literature has led to a synthesis by the researcher of a scheme of criteria for designing high-quality differentiated learning elements by identifying and describing the conditions and processes of meaningful learning elements that are responsive to learner diversity. The constitution of this scheme is underlain by principles of

a) meaningful learning (Getha-Eby, 2014; Ausubel, 2000; Gagne et al, 1993; Anderson et al, 2001; Bloom, 1956),

b) curriculum design (Wiggins and McTighe, 2005; Kalantzis & Cope, 2004),

c) intrinsic motivation (Renninger, 2011; Krapp, 2005; 1999; Deci, 1992; Erhman & Dornyei, 1998; Hidi, 2006),

d) multiple intelligences (Gardner, 1993),

e) multiliteracies (Kalantzis & Cope, 2004),

f) experiential learning (Kolb, 2009; 2005), and

g) social learning (Wenger and Wenger-Trayner, 2015; Wenger et al., 2011)

To help teachers design high-quality differentiated learning elements, this PhD study proposes the use of two useful practice-focused tools for lesson designs, a) Kalantzis and Cope's (2004) **Learning by Design** (LbD) knowledge processes template, which makes explicit a whole repertoire of different learning pathways, and b) Wiggins and Mc Tighe's (2005) **Understanding by Design** (UbD) lesson planning template, whose emphasis is placed on essential knowledge of the content area a meaningful learning element should cover.

With respect to teacher professional development (TPD) on DI, the study aligns with voices such as Darling-Hammond's (2003), who advocate for the need to professionalize teaching and invest in knowledgeable autonomous and peer networked professionals as a reform approach to a more equitable quality education, and Korthagen (2017), who stress the need to focus on individual teacher learning needs. This study uses transformative learning (Mezirow, 1996; 1997) as a general framework to understand the barriers that current educational cultures place on teacher practice, to identify the changes that different teachers must pass through in order to be able to effectively implement DI in their classrooms and to explore the

necessary processes and conditions that a TPD program on DI should employ in order to effect those changes in its participant teachers.

Grounded on this study's synthesis of the DI pyramid, the review of the relevant literature on TPD has resulted in the proposal of an original synthesis of a polyvocal transformative TPD on DI setting the aims of:

a) teacher mindset change from non-openness to openness to diversity pertaining to the affective level of DI, and

b) the development of teacher ability to design high-quality differentiated learning elements pertaining to the planning level of DI

This study proposes the use of DI for TPD assuming that teachers need to experience the new learning paradigm of DI and learn within a Community of Practice (CoP) (Wenger et al, 2011) culture of differentiated education through multiple learning pathways, which at the same time address their own individual learning needs to be able to teach for diversity effectively. The underlying rationale of teacher professional development on differentiated instruction is that any one-dimensional approach to teacher professional development would most probably fail to capture and address the demands of effective teacher change. What is more, Kalantzis and Cope's (2004) Learning by Design (LbD) framework of a polyvocal pedagogy, a diversity-sensitive framework that employs processes of both meaningful and transformative learning, is proposed to help teacher educators build meaningful and transformative differentiated learning experiences and interactions for teachers.

1.7. The structure of the thesis

The present thesis is divided into ten chapters. This chapter, Chapter 1, introduces DI within the context of inclusive, equitable and quality education, the problems that DI presents, a short literature review of the study, the purpose, research questions and methodology of this research along with the structure of the thesis.

Chapter 2 includes a review of DI research building up to an original research synthesis on the nature of DI beginning with a reframing of learner diversity and the identification of three DI levels. The rest of the chapter explores in greater depth the first two levels, which are considered foundational, a) teacher openness to diversity and developing learner intrinsic motivation, and b) teacher planning of a high-quality differentiated curriculum.

Chapter 3 presents LbD, a tool for helping teachers design high-quality differentiated learning elements focusing on a polyvocal variety of eight knowledge processes and drawing explicit links to DI. Then, Understanding by Design, a complementary tool to LbD focusing on the identification of the crucial concepts of the content area, is presented.

Chapter 4 presents a review of the literature on teacher professional development and teacher professional development on DI. It also draws an original synthesis of a polyvocal transformative model of TPD on DI based on the propositions drawn from the literature review in chapters 2, 3 and 4 of this study centering around principles of DI, transformative learning, and CoPs using the LbD framework for the design of high-quality differentiated TPD on DI curriculums.

Chapter 5 presents Exploring DI Together (EDIT), the polyvocal transformative TPD program on DI that was designed, implemented and tested in the context of this research. The chapter presents EDIT principles, aims and expected outcomes, the program's content and structure along four LbD cycles, and the EDIT CoP.

Chapter 6 presents in greater detail the research design and methodology of the evaluative case study employed in the context of an insider research. It, then, presents the rationale of the sample and the Scholar platform used and it, finally, describes the research instruments utilized in the study.

Chapter 7 presents the quantitative and qualitative findings answering the 1st research question of the study relating to the participant teachers' perceptions of their

experience with EDIT. The findings explore in detail the participants' profile and experience with DI before EDIT, their satisfaction with the program and the five emergent themes of the analysis depicting the essence of teachers' experience with EDIT.

Chapter 8 presents the quantitative and qualitative findings answering the 2nd research question of the study relating to EDIT effectiveness in transforming teachers' educational frames of reference. The findings explore in detail the participant teachers' openness to diversity before and after EDIT and present the results of teachers' self-reports on the changes they identified due to their participation in EDIT.

Chapter 9 presents the results of the qualitative findings answering the 3rd research question of the study relating to EDIT effectiveness in developing teachers' ability to design high-quality differentiated learning elements. The findings of the teachers' learning element analysis explore case by case teachers' ability to design such learning elements before and after EDIT including a comparative analysis of change of all teacher cases in the end.

Chapter 10 discusses the findings of the study. The issues discussed in detail is the participant teachers' openness to diversity before EDIT, teachers' experience with EDIT, teacher mindset change after EDIT, the development of teacher ability to design high quality differentiated learning elements after EDIT, the implications, and limitations of the study, and, finally, suggestions for future research.

Chapter 2:

Exploring Differentiated Instruction (DI) from a Teacher Professional Development on DI Perspective

2.1. Introduction

This chapter attempts to set the ground and illuminate the nature of DI and consequently the necessary competences that the differentiating teacher should have to be able to differentiate effectively. The literature review of diverse research in the field has led to a research synthesis resulting in an original reframing of DI, an integrative and comprehensive DI model in the form of a pyramid, which consists of three differentiation levels, a) the *affective* level, b) the *planning* level, and c) the *instructional* level. The first two levels, which are the focus of this study, are considered foundational for the third level to build on.

This chapter starts by situating the study within the context of past and current DI research. It goes on with an in-depth presentation of the affective and the planning levels of DI in relation to their respective teacher competences considered essential for each one of those two DI levels. In essence, it is purported that those two levels and the teacher competences identified should be the focus of any initial TPD program on DI. Special focus is given to the concept of learner diversity that the study adopts, which is a synthesis again of the learner variables that Tomlinson (2001; 2003) acknowledges in her framework, namely, learner interest, readiness, and preferred modes of learning, complemented by Kalantzis and Cope's (2016) construct of learner lifeworld. This conceptualization of learner diversity is purported to result in a more holistic and realistic spectrum of learner differences helping define more effectively the nature of DI and the underlying processes that should guide practice

2.2.   The origins of DI: a century of educational research

DI constitutes one of the very first attempts of the educational world to

conceptualize holistically and involve in one construct all the different variables involved in the teaching and learning of diverse learner populations. It is heavily rooted in cognitive-psychology, brain research and a century of educational research and theorizing on the process of learning (Rock, et al, 2008; Paul, 2005; Morgan, 2014). Paul (2005) highlights that this research has yielded a new paradigm of how learning happens most effectively, efficiently and meaningfully and that this paradigm actually supports DI practice. In Tomlinson's (1999, p.17) words 'it is a natural outgrowth of a burgeoning understanding of the ways children learn'. In fact, different writers highlight different influences and principles of DI. For example, Santamaria (2009) argues that DI has borrowed from seminal works of all well-known scholarship such as Bloom (1956), Bruner (1966), Taba (1962). On the other hand, Morgan (2014) acknowledges Lev Vygotsky's concept of the zone of proximal development as a main influence on DI understanding teachers' role as that of careful designers of structured learner experiences, which should match each learner's different knowledge level and stretch it through appropriately challenging activities. In reality what this means is that DI is a collection of different variables of teaching and learning taking into account the specific characteristics of students, which makes it very difficult to holistically identify all its 'active components' (Coubergs et al, 2017).

One of the most influential strands of research for the emergence of DI is research on human intelligence and learning styles, which recognizes student's cognitive differences in learning. The traditional psychological view about intelligence was that it is a single general underlying mental human capacity for problem solving and conceptualization, which could be measured and reflected as a fixed score, the Intelligence Quotient (IQ), through mental testing (Kornhaber, et al, 2004; Gardner, 1993). The result of this sort of static conceptualization of intelligence, which viewed it as a fixed trait that a learner either has it in sufficient amounts or not, underlain some very restricted views of both learning and learners. The learners whose IQ scores were not satisfying were doomed to disregard from the educational world as 'incapable of learning', while learning was narrowly constricted to the instruction and assessment of learners' language and logical-quantitative skills (Gardner, 1993).

Research, though, in the field of psychology has inescapably altered the modern views about intelligence. Fist in the list is Howard Gardner's (1983; 2008) research, which resulted in the theory of Multiple Intelligences (MI), one of the most influential theories to oppose the dominant perception of human intelligence as a single general intellectual ability to solve problems and understand concepts. MI theory perceives human cognitive competence as a set of eight different abilities, or else, intelligences, to process certain kinds of information, namely, the verbal-linguistic, logical–mathematical, visual- spatial, musical–rhythmic, bodily–kinesthetic, interpersonal, intrapersonal, and naturalistic intelligence. Such conceptualizations of intelligence as multifaceted have signaled a shift in perspective that has opened the road to differentiation allowing to a much wider spectrum of students to be recognized as intelligent or talented due to their strength in a variety of different cognitive abilities. They also held education responsible for constricting the learning and growth of all these different sorts of intelligent people by narrowing held beliefs of intelligence expressed and assessed solely through the linguistic or logical-quantitative mode. Perhaps, one of the greatest educational implications of the theory is that it has forced teachers to recognize human difference and made them see that any uniform educational approach would serve only a minority of learners, those who are taught at their learning strengths.

The second most influential aspect of such intelligence conceptualizations relates to their variable nature. Gardner defines intelligences as a psychobiological potential that can be realized as a consequence of experience, motivation and culture (Gardner, 1995). In other words, intelligence is not assumed to be stable within an individual but the result of interaction between the individual's inherent potential and the opportunities offered by its cultural context (Gardner, 1993). Thus, intelligences are not seen as fixed traits but as having the potential for development and change through the learners' interaction with their environment.

2.3.   Positive learning outcomes of DI

Shareefa and Moosa's (2020) bibliometric analysis shows an increased interest of

researchers and publishers in DI with an overall constant rise in related publications from 2007 onwards, especially in the USA. They report that the highest number of published papers is related to the various instructional DI strategies teachers use in their teaching and students' literacy development in relation to teachers' use of various DI strategies. Indeed, several studies report on the positive outcomes that the use of DI has on student learning and motivation (Rock et al, 2008; Subban, 2006; Huebner, 2010). For example, Mc Adamis' (2001) study shows that teachers' use of DI resulted in significant improvement in the test scores of low-scoring students in the Rockwood School District (Missouri) together with students becoming more motivated and enthusiastic about learning.

Likewise, McQuarrie and McRae's (2010) research review of 25 site-based research projects, which focused on implementing effective DI practices, report on those programs positive impact on student learning over a three-year period (2003-2006). The majority (64%) of the projects focused DI efforts around all students of inclusive classrooms, while the remaining (36%) on specific groups of learners (e.g. special education students, English language learners, highly able/gifted learners, and students considered at risk for leaving school before completion and disengaged learners). The results of the review showed that DI a) enhanced student self-confidence and engagement, b) students became more self-directed and metacognitive learners, c) DI practices were effective in reaching all learners from special needs groups to general student population across grade levels and curriculum areas, while d) students who were more at risk or had higher needs experienced the greatest gains from differentiated support through small group or one-to-one interventions. Coubergs et al. (2017) argues, though, that while different studies investigate different aspects of DI and their effects on learning outcomes, *current research lacks any empirical validation for DI as a 'package' including teachers' philosophy and practices as a whole.*

In the field of TEFL, Haley's (2001) pilot study in some USA foreign and second language classes revealed the impact that the implementation of the theory of MI in teaching has had on both teachers and students. For example, it is reported that the

students responded positively to the increased variety of instructional strategies based on MI, while teachers felt able to reach more students. Generally, the MI theory has exerted a special influence in the field of TEFL with practitioners having widely accepted MI theory and its principles (Savas, 2012) and researchers investigating the impact and utility of MI theory for successful EFL learning. For example, Alavinia and Farhady's (2012) investigation of the possible effects that the implementation of DI in the light of learners' multiple intelligences and learning styles would have on foreign language learners' vocabulary learning revealed a significant positive impact.

2.4. Carol Ann Tomlinson's DI framework

Carol Ann Tomlinson's DI framework, which evolves through the years, is one of the first and most systematic attempts to conceptualize DI in a holistic manner launching a pathway on how teachers can differentiate. It is indicative that Bondie et al. (2019) in their rigorous literature review, found that 64% of the studies reviewed used Tomlinson's framework to guide their definition and operationalization of DI in the classroom. Tomlinson (2001) defines DI as the modification of three curriculum-related elements, that is, a) what students learn (content), b) how they learn it (process), and c) how they demonstrate what they have learnt (product). Later, a fourth element has been added, namely, affect or learning environment, which refers to students' emotional needs (Tomlinson and Imbeau, 2010).

More recent research suggests that while Tomlinson's definition of DI has been useful, DI rooted in Tomlinson's framework overwhelms teachers due to the unlimited possible combinations of teacher responses making it difficult for them to actually differentiate in practice (Bondie et al., 2019). This finding points towards current reality where research still struggles with inconsistent and vague definitions, principles and practices of DI, which is now seen as a complex teaching skill. Towards that direction, Tomlinson (2003) calls attention to the fact that DI is not a recipe for teaching or an instructional strategy but a philosophy guiding a whole way of thinking about teaching and learning (Tomlinson, 2000). Often, however, it was found that DI is equaled to the use of a variety of instructional strategies such as learning/interest

centers, RAFTs, Graphic organizers, tiered assignments, learning contracts, tic-tac-toe, independent projects, intelligence preferences, small-group instruction.

2.5. Current theorizing on DI: shifting focus to teachers' instructional reasoning and the underlying processes' of effective differentiation

Some prominent current examples of research and theorizing on DI are cross-Atlantic and help answer perplexing core questions about the nature of DI, the skills and knowledge teachers need in order to differentiate along with the factors that contribute to its acknowledged complexity. Characteristic such examples are Bondie et al.'s (2019) research coming from the USA and van Geel et al.'s (2019) research coming from Europe which both share an overlapping reframing of DI conceptualization and identified heated gaps in the relevant literature that set out to answer.

Bondie et al. (2019) literature research identify a gap with respect to DI inconsistent definitions along with a vague view of how it can be operationalized in the classroom resulting in a quite vague and confusing vision of how in reality DI can ensure effective learning for all learners. Thus, they call attention to the need to improve the theoretical framing of DI. In the same line, van Geel et al.'s (2019) study sets the question of what quality differentiation looks like identifying the need for a clear definition of quality DI together with questions of how it can actually be enacted in practice acknowledging that DI is a complex teaching skill that requires particular skills and knowledge from the teacher.

These gaps in the theoretical framing of DI are also reflected in the relevant DI research reviewed. For example, Bondie et al. (2019) acknowledge that so far the focus of research has been on superficial aspects of DI such as the use or nonuse of certain materials and activities. They recognize, though, that there is a need to shift the focus to the teachers' instructional reasoning and decision-making underlying teacher practice so as to gain a deeper understanding of the 'underlying processes' of effective differentiation. Accordingly, van Geel et al. (2019) claim that while previous

studies on DI with respect to the application of certain DI strategies have been informative, there is a need to gain a more nuanced understanding of the acting and reasoning of teachers who manage to differentiate effectively.

It is acknowledged that 'the key to successful differentiation is not the application of strategies, but the actual adaptation of teaching to the thoroughly identified needs of all students' (van Geel et al., 2019: p. 62). This statement underlies their understanding of DI as teacher deliberate and accurate choices informed by their knowledge of students and subject matter and based on a variety of well-thought goals, the analysis of students' instructional need, and combined with teacher continuous monitoring of student learning and necessary adaptations during instruction. That is why, in the same line, Bondie et al. (2019) talk of the need for research to reframe its focus from a content-process-product conceptualization of DI to a focus on teacher decision making with respect to DI.

What follows are Bondie et al. (2019) and van Geel et al. (2019) reframing of DI, which help situate this study's framing of DI within current research. Starting with Bondie et al. (2019, p.355), they define differentiation as

> the outcome of a continuous decision-making process where teachers *look and listen* for academic diversity that will strengthen or impede effective and efficient learning, and then adjust instruction to increase *Clarity*, *Access*, *Rigor, and Relevance* (CARR) for all students within a learning community.

They then go on to identify three types of DI, which follow a pyramid-like rationale and responding gradually to the needs of all students, some groups of students, and, then, individual students. The first one is *Adjustable Common Instruction,* which refers to the majority of teaching time in the classroom and relies on routines that research has shown to have maximum impact on learning for all learners. Thus, students have the same learning goals, use the same resources and assessments so that teachers do not take the time to design anything new. The second type is *Specific Resources*, where again the lesson objectives and assessments are the same for all students. It is only

some group of students or some individuals who use different resources combined with a particular teaching approach. And, the third type of DI is *Individualised DI*, which refers to work-out plans for individual students giving them the opportunity to review, practice, extend learning or pursue an interest.

On the other hand, van Geel et al. (2019) research results reveal that DI is indeed a complex teaching skill, whose level of complexity is situational and depends on

i)   *the content of the lesson,* i.e., the lesson goals and topic

ii)   *the composition of the group*, i.e., the range of student diversity, the number of grades, and the number of students with Special Educational Needs (SEN) within the group

iii)   *school support,* i.e. the extent of collaboration with colleagues and the existing facilities

iv)   *the curriculum material*, i.e., existent materials and suggestions for remediation

v)   *data regarding student achievement and progress*, i.e., the richness, availability and usefulness of information about students

In addition, what adds to DI complexity refers to the *interrelatedness* of learning phases and teacher skills inherent in the nature of DI. In other words, van Geel et al. (2019) explicitly acknowledge that effective differentiation involves not only lesson preparation, that is planning *before* teaching, but also the time *during* instruction together with some general *teaching quality* aspects. This view of DI agrees with Parsons et al. (2013) conceptualization of DI, who argue that the then current conceptions of DI were too narrow when they contended that DI is restricted to planning. They recognize that the planning phase is the foundation of DI but solely planning does not capture DI complexity. It is also the adaptations that the teacher has to make in the midst of instruction that are an important aspect of DI.

Van Geel et al. (2019) literature review resulted in a *differentiation skill hierarchy* of six overarching categories of differentiation skills. This hierarchy renders an explicit image of what constitutes DI throughout all learning phases. The first category of skills

refers to the phase of teaching *prior to instruction*, and involves a) curriculum, that is planning a sequence of learning tasks, b) identifying learners' instructional needs, and c) setting challenging goals by taking into consideration the curriculum and student needs. The second category refers to the phase *during instruction*, and involves a) monitoring and diagnosing student progress, and b) adapting instruction and activities accordingly through grouping, materials, assignments, activities, pacing and providing learning time, questions, and instruction. The third and final category refers to some general teaching quality dimensions, such as a) the creation of a safe classroom climate, and b) teaching specific student skills such as critical thinking or research strategies.

What follows is an in-depth exploration of DI in the context of diverse literature review and synthesis in an attempt to tentatively answer the main research question of this study, namely 'what makes effective teacher professional development for DI'. In fact, the exploration of DI nature is inherently connected with the identification of the core teacher competences necessary for effective differentiation.

2.6. Reframing Learner Diversity: the learner's lifeworld, readiness, interest and learning profile

This study adopts Kalantzis and Cope's (2016) conceptualization of human differences centering around the notion of 'a learner's lifeworld' complemented with Tomlinson's (2001) three useful and more specifically identified learner differences. Tomlinson's framework defines learner variance in terms of three cognitive-learning dimensions making learner difference more concrete and manageable to the teacher. It focuses teacher attention to students' diverse readiness levels for learning, student diverse interests and learning profiles. However, as Santamaria (2009) argues this sort of differentiation needs adjustments. It responds only to learners' cognitive differences not completely benefitting children who are culturally and linguistically different arguing for the need of a *culturally responsive DI.*

This has important implications for Teaching English as a Foreign Language (TEFL) where students' different language proficiency levels, skills competence in their mother tongue, their different cultural and educational experiences as well as their different motivation and attitude towards English (Tzanni, 2018) are of central importance for student achievement. The essence of culturally responsive teaching is instruction that acknowledges and incorporates in learning the learners' diverse languages and cultures. However, it is argued that learner variance and subjectivity is endless and not specific only to the learners' cognitive profile or their cultural and linguistic background. It is, thus, purported that Kalantzis and Cope's (2016) concept of a learner's 'lifeworld' seems to most accurately capture the whole of learner subjectivity and diversity.

Learner lifeworld stands for the everyday lived experience that learners bring with them into learning. It is the whole set of learner habits, values, behaviors and interests as they are shaped within the context of their families, their friends, their peers, their local communities and wider cultural influences. As Kalantzis and Cope (2016, p. 115) state '(t)he lifeworld is the ground of our existence, the already learned and continuously being-learnt experience of everyday life' defying common classifiers of human differences in terms of demographics such as social class, language, ethnos, age, physical and mental abilities. In other words, learner lifeworld embraces learner human subjectivity in its totality away from strict social and other categories, which often form the basis of constraining stereotypes'. The concept of learner 'lifeworld' fills the gap that Santamaria (2009) has identified for DI to be able to acknowledge and respond to the wide spectrum of learner diversity. But it fills that gap in a much broader way to strictly cultural references and closer to *all* learners' different 'life trajectories' as Kalantzis and Cope (2016) call learners' personal idiosyncratic narratives.

At the same time, this necessary broad concept of learner 'lifeworld' bringing attention to each learner's different and unique subjectivity is sufficiently complemented with Tomlinson's three more cognitively focused learner differences, which have been identified to be core to effective learning, that is, learner readiness,

interest, and learning profile. **Learner readiness** refers to the learners' *previous knowledge* of the subject matter. Differentiating according to learner readiness requires from teachers to identify first the learners' starting point with respect to what is to be taught and then to offer tasks that are a good match to each student's different starting points (Tomlinson, 2001). Offering tasks that are a good match to each student's readiness levels is guided by the principles of moderate challenge and support in line with Vygotsky's Zone of Proximal Development concept. Each student should be offered challenging tasks that extend their knowledge, understanding and skill just a bit beyond their comfort zone and then offered support to bridge that gap between the known and the new (Tomlinson, 1999; 2001).

Interest is acknowledged as a powerful motivator for learners that can secure their engagement with learning (Tomlinson, 2001; 2003). That way the importance of emotions and feelings for learning are explicitly recognized. In Tomlinson's writings of DI, interest is acknowledged as key for enhancing student motivation, helping students connect unfamiliar ideas and knowledge with more familiar, and inviting student affect in the classroom. 'The goal of interest differentiation is to help students connect with new information, understanding and skills by revealing connections with things they already find appealing, intriguing, relevant and worthwhile' (Tomlinson, 2003; p. 6-7).

Learning profile is an umbrella term that includes many different categories of students' preferred modes of learning (Tomlinson, 2009). The premise that underlines this category of learner difference is that people have preferences for different ways of learning and teachers will be able to promote more effective and efficient learning for all, if they can offer those options to their learners (Tomlinson, 2001). The two main variables that determine learners' different learning profiles according to this study's analysis are learners' multiple intelligences according to Gardner (1993) and different learning styles according to Kolb (2005; 2009) in alignment with his experiential learning cycle. Learners have different *intelligence preferences*, 'the brain-based predispositions we all have for learning' (Tomlinson, 2001: p. 62) (see section 2.2), and exhibit different intelligence profiles each having a different

combination of strong and weaker intelligences – and it is exactly this potential that DI seeks to exploit. The learners' different *learning styles* variable is defined as the preferences that learners have with respect to environmental elements in the classroom context, interactions with peers and personal needs (Tomlinson, 2009). However, this definition and description of learning style differences lacks any cohesion to be of practical use to the teachers who decide to differentiate their instruction according to their learners' different learning styles.

The problem lies with research on learning styles per se, which has reached no consensus over the years. Different researchers use different labels to name often overlapping learning style constructs. Riding and Cheema (1991 in Riding, 1997) found over 30 labels used in the relevant research, which they then grouped into two main cognitive style dimensions, the wholist-analytic and the verbal-imagery. Daniel Willingham (in Tomlinson, 2009), a psychologist and neuroscientist at the University of Virginia, argues that people do learn in different ways, but it is not really useful to try to translate learning profile research results which come out in lab settings into classroom practice, because classroom learning in reality is more complex and involves many more variables.

David Kolb's learning styles theory, though, could make a difference in helping educators better understand learner differences and at the same time draw important connections to their practice. The greatest strength of Kolb's theory is that it is based on a theory of learning, Experiential Learning Theory (ELT), where the different learning styles are conceptualized holistically in a comprehensive framework of learning. ELT learning is the result of combining *four different learning modes*, two modes of grasping experience - Concrete Experience and Abstract Conceptualization - and two modes of transforming experience - Reflective Observation and Active Experimentation (Kolb, 1984 in Kolb and Kolb, 2005; 2009). To sum up, learning is seen as an idealized learning cycle, which involves the learner moving round all four different learning modes, from *experiencing* to *reflecting* to *thinking* to *acting.* In essence, ELT includes in a unified conceptual framework many different modes of

learning, contrary to most learning theories, which tend to develop in isolation from one another (Beard et al., 2006).

Within this context, learning style is defined as individual preferences in learning for particular learning modes of the ELT learning cycle. It is important to note that evidence from neuroscience research suggests that the different learning territories of experiential learning are related to the process of brain functioning. Kolb and Kolb (2005) citing research from Zull (2002) show that a) the sensory cortex of the brain relates to concrete experiences and feelings, b) the integrative cortex at the back of the brain relates to reflective observation, c) the frontal integrative cortex is responsible for the creation of new abstract concepts and d) the motor brain is responsible for action. Further supportive evidence comes from Hickcox's (1991 in Kolb and Kolb, 2005) unpublished doctoral dissertation, where after a qualitative analysis of 81 studies focused on experiential learning theory it is shown that 61.7% of the studies supported experiential learning theory, 16.1% showed mixed support, and 22.2% did not support experiential learning theory.

Each dimension of learner diversity, i.e. learners' different life-worlds, readiness levels, learning profiles and interests, points to different teacher practices and decision-making with respect to *how* they can respond more effectively to learner diversity (see 2.9. below).

2.7.   Reframing DI: an original research synthesis on the nature of DI

The review of literature research on DI and inherently connected fields has led to the original synthesis by the researcher of an integrated and comprehensive model of DI to underpin this investigation, which is conceptualized along three distinct and hierarchical levels, a) the affective level, b) the planning level, and c) the instruction level (see Fig. 2.1). This model argues that DI has a strong affective nature beyond teaching practices and strategies, which this research acknowledges to be the starting point for effective differentiation, its first level, despite the focus of most research on DI strategies and processes (Bondie et al, 2019; van Geel et al., 2019; Tomlinson, 2001;

etc). This is a look into differentiation from a different perspective. It's not learning or motivation theories that guide teacher practice but *beliefs* and *attitudes* and how these beliefs are enacted into classroom practice. It is the affective approach to the 'what' and 'how' of differentiated instruction. Tomlinson and Imbeau (2010) point to the beliefs that underlie differentiation and how these beliefs guide teachers' affective response to student needs and management of a differentiated classroom.

This PhD Research Differentiated Instruction Pyramid with descriptors
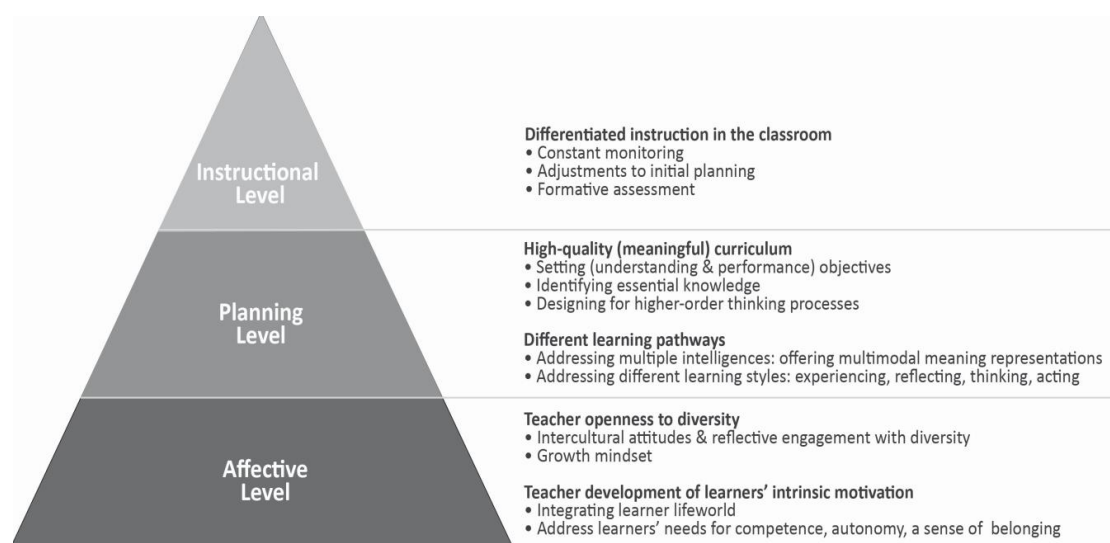
Figure 2.1. The figure depicts this PhD research synthesis from the literature reviewed of differentiated instruction as a three-level pyramid along with short descriptors of each level.

The type of teacher beliefs and attitudes that this study identifies as core for effective differentiation is captured into the construct of *teacher openness to diversity*, a superordinate term constitutive of two distinct but interrelated sets of beliefs and attitudes. The first set bears a close relationship to teachers' intercultural attitudes and reflective engagement with diversity and the second set refers to Dweck's (1999; 2012) growth mindset concept, which positively predicts teachers' ability to differentiate (Coubergs et al.'s, 2017). In parallel, a core concept to DI is *interest* (Tomlinson, 2000; etc), whose nature is greatly affective contrary to the 20th century research on learning theories and motivation which rendered the concept of interest

'superfluous' influenced from behaviorism and cognitivism (Krapp, 1999). Hidi (2006) explains that this is due to the fact that the importance of *feelings* and *emotions* for learning has only recently been recognized by research. Differentiation requires from teachers to create particular affective conditions to effectively address learner needs such as feeling competent, autonomous, and a sense of relatedness.

What this research identifies as the second level of DI is closer to Tomlinson's (1999) definition of differentiation as pertaining to teachers proactive planning of their teaching assuming that different learners have different learning needs. The importance of high-quality learning elements for all learners' effective learning was continually underscored in her writings.

> *we have to know where we want to end-up before we start – and plan to get*
> *there. That is, we must have solid curriculum and instruction in place before*
> *we differentiate them. That's harder than it seems (Tomlinson, 1999: p. 13)*

Tomlinson (2000) claims that differentiation is, indeed, a facet of expert teaching and it is actually a refinement of high-quality learning elements and instruction – not its substitute - explicitly delineating the inherent connection of high-quality learning elements to effective differentiation. This conceptualization of DI aligns with Bondie et al.'s (2019) and van Geel et al.'s (2019) studies of DI. Van Geel et al.'s (2019) study acknowledges that there is a stage of differentiation prior to instruction which involves teacher planning of the learning element through a series of steps such as mastering the curriculum, etc (see 2.5). The rationale of what Bondie et al. (2019) identify as a distinct type of DI, i.e. adjustable common instruction (see 2.5), also aligns with learning element planning, that is, planning beforehand for the majority of teaching time according to principles of effective and meaningful learning for *all*. Each of these studies gives emphasis in a complementary fashion to different aspects of the design of a high-quality differentiated curriculum, as the second level of DI that this study proposes and adopts.

The third level of DI, following van Geel et al. (2019) and others (e.g. Parsons et al., 2013) conceptualization of DI, refers to teacher constant monitoring and formative assessment during real-time instruction in the classroom. Such monitoring and assessment in a cyclical manner guides teacher adaptations during instruction and afterwards on reflection of their teaching practice. It is purported that the third level of DI, is a higher-order level of DI, which assumption agrees with the latest research of Smets and Stuyven (2020), which shows that 15teacher use of cyclical responsivity in the form of continuous assessment is a higher-order type of DI competence. The focus of this research sits with the first two levels, which are seen as foundational for determining a teachers' ability to differentiate effectively. This research purports that this third level of DI essentially builds on the previous two levels and represents teacher accumulated experience and familiarization with DI.

The following sections explore in greater depth the core concepts underlying the affective and the planning level of DI according to this study's conceptualization.

2.8. The affective level of DI: communicative attitudes and behaviors pertaining to teacher openness to diversity and the development of learner intrinsic motivation

Definitions of DI refer to the differentiating teachers' ability to acknowledge student differences (Santamaria, 2009; Shareefa & Moosa, 2020; Paul George, 2005). However, the research reviewed has shown that teachers often hold biased beliefs about groups of students, which affect their teaching practices and behavior (Bondie et al., 2019). Kumar and Hamer (2012) research on preservice teacher attitudes and beliefs towards student diversity has shown that teachers often hold stereotypical beliefs about poor and minority students while a high percentage reported feeling uncomfortable with student diversity. Thus, for a teacher to be able to acknowledge learner diversity is not as unproblematized as it is implied. Instead, it is inferred that dealing with diversity requires from teachers some sort of intercultural competence since differentiating teachers are expected to be able to develop classrooms where segregation is confounded, learners learn how to celebrate one another's growth

through difference while acknowledging that each student may have a different entry point but a common need to learn (Tomlinson & Imbeau, 2010).

Byram (1997) in his influential Intercultural Competence model of foreign language learners claims that the speakers' intercultural attitudes and perceptions about their culturally and linguistically different interlocutors constitute a significant aspect of their intercultural ability (Byram, 1997). Intercultural attitudes involve *curiosity and openness towards 'otherness', a willingness to question one's own culturally biased beliefs and values as the only 'correct' ones and readiness to analyse them from the other person's viewpoint*. As a result, speakers with intercultural attitudes are able to avoid stereotyping, which is due to perceptions of others through a single identity or characteristic. In fact, interculturally competent individuals perceive others as individuals with multiple qualities and identities to be discovered. UNESCO (2013) identifies intercultural competence as a new kind of literacy, namely cultural literacy, having the same value in today's world to reading and writing skills, and putting great emphasis on the perceptions and attitudes component of the construct which is seen as 'a broad toolkit of worldviews, attitudes and competences that young people acquire for their lifelong journey' (UNESCO, 2013, p.5).

What is restrictive to the concept of intercultural attitudes with respect to DI is the fact that those definitions focus solely on **abilities** to perform 'effectively and appropriately when interacting with others who are linguistically and culturally different from oneself' (Fantini and Tirmizi, 2006). Epley (2014) offers a useful framework of people's communicative attitudes and behaviours when they perceive diversity, which is not restricted to cultural diversity (see 2.8.1 below). That way difference is disentangled from culture and defined more generally as the *differentness* we perceive between ourselves and other people, perceptions which appear to hold a central place in all forms of social interaction and communication no matter whether they are intercultural or not (Blaine, 2007: p.1; Epley, 2014). Epley's framework is *a useful tool for better understanding and identifying teachers' varied open and non-open beliefs and attitudes towards diversity.* In this framework, Epley (2014) makes reference to years of research in the field of psychology and social

psychology and describes three main patterns of human attitudes and behaviours when people engage with different others, a) *egocentric thinking, b) stereotypes, and c) reflective engagement*.

Kumar and Hamer's (2012) research most accurately describes teachers' open to diversity and non-open to diversity mindsets investigating the relationship between two usually-not-associated areas of study, multicultural education and achievement goal theory. Kumar and Hamer's study defines **teacher openness to differences** attitudes and mindsets *as openness to different ways of thinking and being and an appreciation of diverse worldviews*, while it describes **closeness to differences** attitudes and mindsets as *inflexible and rigid and endorsing stereotypical thinking.* What is interesting with Kumar and Hamer's (2012) research about openness to diversity is that it reveals close interactions and alignments between intercultural attitudes, growth mindset and mastery-focused beliefs and practices, which give primacy to student learning and improvement engaging students in meaningful and challenging tasks. On the other hand, teacher closeness to difference attitudes and mindsets are underlain by labelling, categorizing, fixed mindset and performance-focused beliefs and practices, which give primacy to looking smarter than the classmates, demonstrating ability, comparing favorably with others in their class. Such beliefs and practices do not align with DI and it is less likely for the teacher to resort to any adaptation of instructional strategies so as to meet the needs of poor and cultural minority students. Kumar and Hamer (2012) research reveals that teachers who wish to create mastery-focused environments are likely to reflect positive intercultural attitudes and be capable of critically examining their own personal prejudices and stereotypic beliefs, contrary to teachers whose focus is on performance-focused learning.

In the following sections, the core dimensions of teacher openness and non-openness to diversity (see Fig. 2.2) will be developed in depth and their interrelationships underlain. Overall, from the research reviewed it is argued that an *open to diversity teacher* exhibits:

a) **intercultural attitudes,** i.e. perceive students as individuals with multiple qualities and identities to be discovered (Kumar & Hamer, 2012), and **reflective behavior**, i.e. questions and critically reflects on their practices and assumptions, find them faulty and revise them (Kumar & Hamer, 2012; Epley, 2014)

b) **growth mindset with respect to teachers,** i.e. a belief that their teaching qualities can change; failure-is-enhancing, i.e. failure as something that motivates learning, performance and growth, and **growth mindset with respect to students**, i.e. a belief that students can change, process-praise and critical feedback; failure-is-enhancing, i.e. failure as something that motivates learning, performance and growth (Kumar & Hamer, 2012; Dweck, 2015, 2012; Coubergs et al, 2017).

To the other end, a *non-open to diversity teacher* exhibits:

a) **egocentric thinking,** i.e. **a** difficulty to acknowledge others' different perspective, and **stereotypes,** i.e. perception of students in terms of binaries not seeing their individual characteristics, and **non-reflective behavior**, i.e. not question or critically reflect on their practices and assumptions, they are always right(Kumar & Hamer, 2012; Epley, 2014)

b) **fixed mindset with respect to teachers,** i.e a belief that their teaching qualities are fixed, it cannot change failure-is-debilitating, i.e. failure as something that inhibits learning, performance and growth (Haimovits and Dweck, 2017), and **fixed mindset with respect to students**, i.e a belief that students cannot change, person-praise and critical-feedback, outcome tied to intelligence, ability labels; failure-is-debilitating, i.e. failure as something that inhibits learning, performance and growth (Haimovits and Dweck, 2017)

Teacher Openness to Diversity & Teacher Non-openness to Diversity
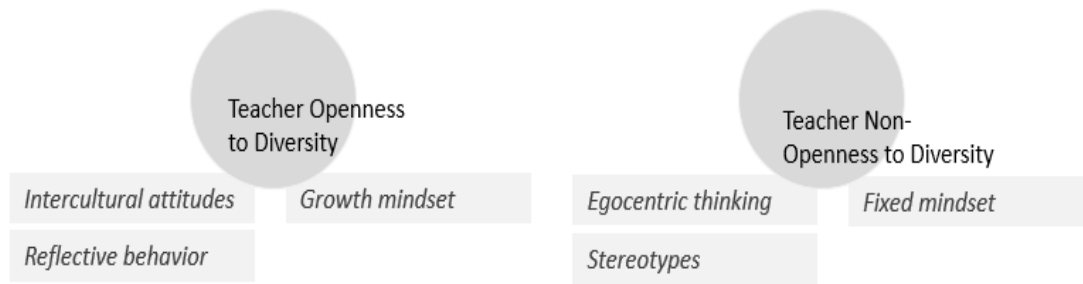
Figure 2.2.The figure depicts the core dimensions of teacher openness to diversity and teacher non-openness to diversity as they are conceptualized in this PhD research as a result of the reviewed literature

2.8.1. Epley's framework of communicative attitudes and behaviors when dealing with diversity

Epley's (2014) framework describes the following three main patterns of communicative attitudes and behaviors when people engage with diversity:

a) **Egocentric thinking** refers to inaccurate inferences due to an egocentric bias, or else, the 'lens problem'. Epley (2014) explains that every person has a unique lens made up of his or her own unique experiences, beliefs, attitudes, emotions, and knowledge through which he or she perceives and interprets the world. The problem begins when people acting out of their unconscious egocentric instincts, like children do in Piaget's early cognitive stages of development, have a difficulty to acknowledge that others may have a different perspective to the world. This inability to understand the reason for people's different interpretations of the same event constitutes naïve realism and leads to inaccurate interpretations due to 'the intuitive sense that we see the world out there as it actually is, rather than as it appears from our own perspective' (Epley, 2014: P.33). As a result, Epley claims that naïve realists believe and feel that they are 'right' and it is the other person who is biased, unreasonable, ignorant, or even evil. These biased interpretations result in perceptions of difference often as insurmountable when people meet others who see the word differently.

b) **Stereotypes** are associated in memory with the social categories that people construct in order to economize their thinking about others and involve thinking about people as members of social groups rather than trying to remember individual characteristics (Blaine, 2007). However, and in contrast to the plain formation of categories, stereotypes involve an overall assessment of the group based on one's own and others' observations. This assessment results in stereotypes, a set of beliefs about the personal characteristics and qualities of the members of that group, which are then automatically and unintentionally associated with individuals (Blaine, 2007; Epley, 2014). The problem with stereotypes is that their content is usually overly dispositional (Blaine, 2007). What is more, it is often negative content associated with negative emotions towards the individual members of a group due to indirect evaluations of a group's inferiority or superiority in comparison to other groups (Kumar and Hamer, 2012). That's probably one of the most powerful dimensions of stereotypes forming the basis for prejudice and inequalities.

In accordance to Kumar and Hamer (2012), Epley (2014) research review shows that people's beliefs in the fixed nature of inner qualities become the basis for the creation of stereotypes pointing to people's permanent inferiority or superiority. The usual path that the mind follows for explaining the existence of difference is that of attributing them to internal and stable traits about the group instead of external and unstable causes (Epley, 2014). The quality of those attributions reveals a mindset that perceives all kinds of traits as *fixed* (see 2.8.2). Thus, negative stereotypes are associated with beliefs of permanent inferiority since the members of that group 'do not have' a socially desired trait and that cannot change.

c) Finally, the pattern, which characterizes an open to diversity mindset, makes reference to a socially competent behavior, that of **reflective engagement with diversity,** or else, 'perspective getting', which refers to a person's conscious attempt to avoid the traps of assumptions and inferences when

interacting with different others and, instead, directly ask and openly listen for the others' perspective. It involves an openness towards difference and a willingness to discover the different other's unique qualities away from egocentric thinking and stereotypes. In fact, Epley (2014) argues that it takes a lot of careful and *reflective thinking* for a person to overcome egocentric thinking. It takes bringing to *consciousness* one's own unique perspective in relation to the others' often different perspective. As Epley (2014, p.179) states '(g)etting someone's perspective requires that you be open to hearing it and that you enable others to give it to you'.

However, such an ability to openly interact with and understand different others does not develop naturally. Instead, the development of a growing awareness of the existence of multiple perspectives in the world is fundamental and it is defined as awareness of the process of construction that our minds go through (Epley, 2014). Such interculturally competent attitudes originate from processes of reflection and raised awareness about the culturally biased nature of values and beliefs, functioning as a filter against biased interpretations when interacting with 'different others'. In accordance to Epley's acknowledgement of reflective engagement with diversity as the communicative pattern that underlies effective communication with diversity, Kumar and Hamer's (2012) research identify teachers' *ability to self-reflect and think critically* as the distinguishing feature of open and close to diversity mindsets.

2.8.2. Teacher growth mindset

Neuroscience research continuously provides evidence of the brain's remarkable plasticity well into adulthood (see Doidge, 2007 in Dweck, 2012). But what appears as even more crucial than the nature of intelligence per se are the beliefs that people hold about intelligence and its malleability. According to Dweck (1999; 2012), people who hold a *fixed mindset,* or else an 'entity theory', believe that intelligence and therefore ability and other human attributes such as personality or moral character

are fixed traits and cannot change through learning. In contrast, people who hold a growth mindset, or else an 'incremental theory' believe that intelligence, ability and other human attributes can change over time through learning and effort.

Relevant research reviewed shows that mindsets can predict learner academic achievement quite strongly (Rattan et al, 2015). The learners' fixed or growth-mindset about their own traits such as intelligence relates to their motivating behavior when faced with challenges and difficulties (Dweck, 2012). Entity theorists tend to avoid challenges losing motivation and showing less resilient in face of difficulties. They quit trying to succeed in fear of failure, which would greatly damage their image and risk appearing not smart enough to others (Dweck, 1999). Thus, they become discouraged and defensive interpreting the setbacks as an indication of their lack of ability (Dweck, 2012). On the other hand, incremental theorists of their own traits tend to seek challenging opportunities for learning and to persist in face of difficulties interpreting failures and mistakes as an inherent part of the learning process - not reason for self-accusation (Dweck, 1999; 2012). In the same line, Coubergs et al's (2017) research on DI-Quest, a theory-driven DI model they developed and validated, provides empirical evidence that teachers' growth mindset perceptions positively predict their ability to differentiate. In contrast, teachers' fixed mindset negatively predicts their implementation of DI.

As Dweck (2015) argues if teachers endorse fixed mindsets about their own teaching ability, they are likely to feel threatened by low-performing students tempted to blame students and their ability for not responding to their teaching. On the contrary, if teachers believe that their own teaching ability can develop, then it is likely to see every student as an opportunity for them to learn more about teaching. As a result, it is *growth-mindset teachers who are equipped with the necessary armamentarium of beliefs and attitudes to sustain the challenges of differentiation* and persist in trying to improve professionally so as to manage to teach for all their students' growth. What's more, DI is about the teacher seeing all their students' potential to learn and grow and growth-mindset beliefs exert the greatest influence driving them to strive to maximize the potential in all of their learners. According to Tomlinson and Imbeau (2014),

teachers with growth mindset beliefs aim high by creating intellectually rigorous curriculums and, then, build scaffolding for their students to help *all* of them unfold their hidden potential and reach those high aims. It is teachers who believe in all their learners potential to learn and grow who are willing to differentiate their instruction by "teaching up" through DI (Tomlinson and Imbeau, 2014: p. 2).

Research reviewed reveals growth and fixed mindsets' interrelation with teachers' intercultural attitudes and their ability to understand and interact effectively with diversity. Dweck's (2012) research has shown that people who hold a fixed mindset about others' traits tend to form quick trait-based judgments leading to labelling and stereotyping as we have already discussed (see 2.8.1.). On the other hand, people who hold a growth mindset about other people's traits tend to understand and interact better with diversity understanding others' behavior in terms of situations and psychological processes such as needs, beliefs, emotions, motives etc. rather than in terms of person-traits. In fact, Dweck's (2012) research presents evidence of the positive effect that a change of people's mindsets from fixed into growth can have in conflict resolution, decrease of aggression, boosting desire for and comfort in cross-race relations, etc. Accordingly, Hattie's (2005 in Coubergs et al. 2017) research shows that growth-mindset teachers are more likely to accept student diversity and tend to view it positively as part of a rich learning environment.

Research evidence also shows that mindsets can change (Haimovitz and Dweck, 2017; Dweck, 2015; Rattan et al, 2015; Blackwell et al, 2007). Teaching a growth mindset to students has been shown to result in a significant boost in students' motivation and achievement especially during challenging academic transitions (Blackwell et al, 2007) and particularly for groups of students who are at risk for lower achievement. (Dweck, 2015). The kind of interventions that have been developed over time and shown to have a positive effect on students' mindset change from fixed into growth are various. Some positive examples are rewarding effort, or, directly teaching students how the brain is like a muscle that grows stronger with exercise with the brain neurons developing new and stronger connections every time they persist with challenges conveying the message that brains and intelligence can grow over time with hard work

and persistence (Dweck, 2015; Rattan et al., 2015; Haimovitz and Dweck, 2017). Rattan et al. (2015) go one step further to suggest to policymakers and educators the revision of current grading practices so as to capture not only students' performance but also their growth over time and the process they used such as the challenges they seek or the resilience they showed.

Rattan et al. (2012) claim that people's beliefs about intelligence are actually culturally shaped. Teachers deliver implicit messages to their learners about the growth or fixed nature of their abilities through praise and the feedback they give them (Ritchart, 2015). Haimovitz and Dweck's (2017) research findings suggest that teachers who cultivate a fixed mindset culture in their classrooms respond to student success with *person praise*, that is, praise their students for personal traits such as goodness or ability. These teachers indirectly 'teach' their students that intelligence is a fixed trait implying that if success meant they are good and able, then failure implies they are not. On the other hand, it was found that teachers who cultivate a growth mindset culture in their classroom respond to student success with *process praise*, that is, praise their students for the strategies they use and their effort (Haimovitz and Dweck, 2017). These teachers indirectly 'teach' their students that success was the result of the process and not an inherent student ability showing them the way to develop their intelligence and ability through learning.

What is more, Haimovitz and Dweck (2017) found that teachers who cultivate a fixed mindset culture in their classroom employ teaching practices that focus on *person* and *ability* by using a) ability tracking, b) tending to communicate lower expectations for students who initially performed lower than others and higher expectations for students who initially performed high, c) using more social comparison in student evaluation, and d) praising students for their 'right answers' and their solutions speed. In contrast, teachers who cultivate a growth mindset culture in their classroom employ teaching practices that focus on *process* and *learning* by a) teaching for understanding, b) asking students to explain their thinking process regardless of them giving a 'right answer', c) giving feedback that deepens students' understanding of the topic, d) evaluating the process of learning focusing on individual students' progress

over time explaining to students that learning is an incremental process, e) highlighting the importance of mistakes and struggles as normal and positive in learning, and f) giving students the space and time to revise their work so as to deepen their understanding (Haimovitz and Dweck, 2017).

2.8.3. Developing learners' intrinsic motivation

The second affective aspect of DI apart from teacher attitudes and beliefs relates to the creation of the appropriate affective conditions for the development of learner interest by addressing all learners' basic needs. Individuals have a neurological predisposition to seek information and develop interest (Hidi, 2006). However, initially interest is triggered from the environment and it emerges as a psychological state, in which the person *experiences* focused attention and positive feelings. If this psychological state of interest is repeated over time due to environmental factors and situational interest is maintained, then, gradually interest develops into an individual disposition where the person shows interest to attend to and reengage with some particular content. In other words, researchers appear to agree that interest is distinguished as (a) a dispositional characteristic of the individual, (b) a characteristic of the environment, namely situational interest, and (c) a psychological state (Krapp, Hidi, Renninger (1992) in Krapp, 1999; Hidi, 2006; Renninger, 2011). They later, also, came to agree that what connects these different types of interest is that they represent in a way different developmental stages of interest (Hidi, 2006; Renninger & Hidi, 2006 in Hidi, 2006; Krapp and Prenzel, 2011 in Renninger, 2011).

Krapp (1999; 2005) relates the positive feelings that the person experiences in interest-based interactions with the concept of *intrinsic motivation* and the satisfaction of the so-called basic needs. Intrinsic motivation is a type of motivation that is based on the inherent human drive to satisfy the three basic psychological needs of *competence*, *autonomy* and *relatedness* (Deci, 1992; Ehrman and Dornyei, 1998). Krapp (1999; 2005) theorizes with empirical evidence that during a person's interaction with the environment the system of basic needs provides continual

emotional signals. If these are positive emotional signals of satisfaction, then interest for a particular content emerges and develops. As a result,

a) when the competence need is satisfied, the learner experiences feelings of efficacy from having exercised his or her existing capacities. For example, motivation theory claims that learners satisfy their need for competence through mastering challenging tasks (Pintrich and Schunk, 1996).

b) when the autonomy need is satisfied, the learner experiences feelings of being independent from undesired pressure, especially when feeling capable of mastering a task with success on their own. Motivation theory claims that the satisfaction of the need for autonomy relates to allowing the learner to make choices so as to feel free and responsible (Pintrich and Schunk, 1996). On the other hand, culturally responsive and relevant education claims that autonomy is achieved through critical reflection on self and society leading to students' growth and empowerment enabling them to make conscious choices and assume responsibility in shaping the course of their own lives (Kumar, et al. 2018).

c) when individuals' relatedness need is satisfied, the learner experiences a sense of belonging to a group with shared interests and it refers to the desire to feel connected to and accepted by others (Krapp, 2005).

Overall, the satisfaction of the students' three basic psychological needs uniquely relates to situational interest (Boekaerts & Minnaert, 2003; Minnaert, Boekaerts, & DeBrabander, 2007 in Renninger, 2011). Thus, it is considered core for the differentiating teacher to cultivate the conditions for the satisfaction of all learners' need for competence, autonomy and relatedness, which can actually trigger learners' *intrinsic motivation* for the taught subject or topic.

Reeve (2009) study reveals that it is teachers' **autonomy supportive style** that encourages and sustains learners' high-quality motivation and higher levels of

engagement with learning resulting in students' more positive feelings and overall functioning. Autonomy supportive teaching is defined as 'the interpersonal sentiment and behavior teachers provide to identify, nurture, and develop students' inner motivational resources' (Reeve, 2009, p.159), which greatly overlaps with teacher openness to diversity since it builds on the acknowledgement, acceptance and support of different student needs and perspectives. In practice, autonomy-supportive teachers a) welcome students' thoughts, feelings and actions, b) take and integrate students' perspectives into the flow of instruction, c) recommend constructive ways of thinking and explanatory rationales, d) nurture students' inner motivational resources such as interests, preferences and psychological needs, e) display patience to allow time for self-paced learning (Reeve, 2009).

Nevertheless, research reviewed shows that teachers usually ascribe to a **controlling motivating style**, which is associated with negative student functioning such as lack of personal interest and positive feelings when they engage with learning (Reeve, 2009). Controlling motivational style is defined as 'the interpersonal sentiment and behavior teachers provide during instruction to pressure students to think, feel, or behave in a specific way' (Reeve, 2009, p.159), which clearly aligns with non-openness to diversity and egocentric thinking. In practice, controlling teachers a) expect from students to adopt the teacher perspective, b) intrude into students' thoughts, feelings or actions pressuring them to think, feel or behave in a specific way, c) rely on outer sources of motivation such as incentives and consequences, d) cultivate perfectionist standards through social comparison and one 'right' answers, e) display impatience for students to produce the right answer, f) typically prioritize and tap rather exclusively into only the behavioral aspect of students' engagement, and g) rely on power and pressure-inducing language such as 'should', 'ought to' and guilt-inducing criticism (Reeve, 2009).

2.9. The second level of DI: planning high-quality differentiated learning elements

What follows is an in-depth exploration of what this study identifies as the second level of DI referring to the design of high-quality differentiated learning elements in two steps. The first step involves the design of a meaningful learning element where

the teacher identifies the essential knowledge of the subject matter area and designs all learners' involvement in higher-order thinking processes. The ultimate aim for all students to reach deep understanding so as to transfer what is taught. The section 2.9.1 below describes the main principles of meaningful learning that underlie the planning of any high-quality differentiated learning element. The second step involves responding to learner diversity i.e. learner different lifeworlds, readiness levels, learning profiles and interests. The section 2.8.2 below, which builds on this study's reframing of learner diversity (see 2.6 above) aims to make explicit the connection between *who* and *how we teach* explaining the rationale that underlies the differentiating teachers' decision-making.

2.9.1. First step: designing for meaningful learning

Recent work in school reform, which has taken place in diverse countries such as the USA, UK and Australia, has pointed out the importance for all students to be taught in a high-quality curriculum designed to develop higher-order thinking skills (e.g., Johnston & Hayes, 2008; Newmann & Wehlage, 1995; Walqui, 1999 in Gibbons, 2008). Gibbons (2008) identifies four important indicators of *intellectual quality* in a study of the notion of intellectual quality among students who use English as a second language (ESL) as a medium to learning. These indicators are: a) *higher order thinking*, which refers to the manipulation of ideas in ways that transform knowledge, b) *deep knowledge*, which refers to the essential and critical ideas of a topic, c) *deep understanding,* which refers to the development of a systematic holistic understanding of the topic, and d) *substantive conversations*, which refer to student interactions around substantive content. These high quality indicators relate closely to *meaningful learning* (see Fig. 2.3).

Meaningful learning principles

Meaningful learning:

- centers around a few core concepts and principles

- connects learners' prior knowledge and experiences with new knowledge on the subject

- involves learners in higher order thinking and active construction of knowledge

- reaches deep understanding to become usable and transferable to real-world contexts and new situations

Figure 2.3. The figure depicts the main principles for designing for all learners' meaningful learning that this PhD research purports to be the first step in planning high-quality differentiated learning elements following the literature reviewed

Meaningful learning is contrasted with rote learning, which has been a popular form of learning in the traditional classroom. What distinguishes the two forms of learning is both the *process of learning* and the *type of knowledge* they aim at (Anderson et al, 2001). Rote learning requires from learners to memorize a wealth of isolated bits of information, which can only serve in successfully passing tests since the learner cannot use the knowledge due to not having primarily understood it. The type of knowledge that rote learning aims at is basically factual knowledge of terminology and specific details and information (Anderson et al, 2001). On the other hand, meaningful learning requires from learners to reach deep understanding of the subject matter so that knowledge becomes usable and transferable to real-world contexts. The building blocks of meaningful learning and understanding are **concepts**, or else, generic ideas, that are abstract, generalized, categorical content which serve as the foundation for latter more detailed and factual knowledge to be build and organized (Ausubel, 2000; Getha-Eby, 2014). As researchers explain the human mechanism uses different levels of generality and abstraction in order to acquire, store, and retrieve more efficiently the vast quantity of ideas and information that exists out there in the world (Ausubel, 2000; Gagne et al.,1993).

Deep understanding can only be achieved by setting the conditions of meaningful learning under the constructivist paradigm, that is, **learners need to actively construct and make sense of knowledge** (Ausubel, 2000; Anderson et al, 2001; Getha-Eby, 2014). What is required for learners to make sense of the new knowledge is a) to mentally integrate it with already existing knowledge and, b) to organize it into a coherent whole through higher order thinking (Ausubel, 2000; Anderson et al, 2001; Gagne et al, 1993; Getha-Eby, 2014). This development of a systematic and holistic understanding of the taught topic or subject matter is what deep understanding is all about (Gibbons, 2008). Thus, the first inescapable finding for meaningful learning is that the learner finds some connection between the new ideas to be learned and his or her previous knowledge (Ausubel, 2000; Gagne et al, 1993; Getha-Eby, 2014). If no connection can be established between the new and the prior, already existing knowledge, then no meaning can be made for the learner, and thus very little is learned (Gagne et al, 1993).

That very first condition of meaningful learning, **starting from the learner's previous knowledge** on the subject matter, makes it clear why it is essential for teachers to acknowledge their students' different readiness needs. The importance of previous knowledge is, also, supported by research findings in neurobiology where brain imaging studies show that previous knowledge is substantiated in the form of already established neuronal connections, which serve as a pathway for the transmission of information (Kumaran et al, 2009 in Getha-Eby, 2014). These studies, also, show that each learning experience results in the creation or expansion of neuronal connections in the brain.

For a learner to draw connections between the new knowledge and the already existing one takes translation of the new knowledge into a new form through the establishment of a relationship with the old knowledge (Ausubel, 2000). And this is the second condition for learning. **Learners must somehow organize hierarchically the relationships that exist between old and new** (Ausubel,2000; Gagne et al,1993; Anderson et al, 2001). That way, learners' knowledge structure is organized into a coherent whole where knowledge is structured into different levels of generality and

where relationships and the principles governing those relationships are readily recognized. This coherent knowledge organization results in deep understanding which is the primary condition for knowledge to become usable and transferred into real-world problem-solving and decision making (Gagne et al. 1993; Getha-Eby, 2014).

A valuable teacher guide for learners' coherent organization of knowledge and transformation is Bloom's (1956) taxonomy[1] of educational objectives categorized in terms of their cognitive complexity. The value and the importance of the work consists in its *identification of particular cognitive processes* that are involved in meaningful learning. The taxonomy provides teachers with a most useful guide in planning high-order thinking curriculums and activities. In particular, the specificity of the cognitive processes makes explicit to teachers *the pathways* they can use to guide students in their own construction of meaning by drawing connections between their prior knowledge and new knowledge.

2.9.2. Second step: responding to learner diversity

This section makes explicit the rationale that underlies the differentiating teachers' decision-making when designing a high-quality learning element which is responsive to learner diversity by drawing the connection between the different learner diversity categories that this study acknowledges and appropriate teaching practices (see Fig. 2.4).

The acknowledgment of **learners' lifeworld** as a distinct category to the narrower category of learner readiness, which refers strictly to learners' cognitive knowledge with respect to the taught topic, opens the way to the design of learning element

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[1] At the lowest scale of Bloom's taxonomy stands the cognitive process of *Remembering*, which is the simplest form of learning. Higher up in the taxonomy stand the processes of *Understanding, Applying, Analysing, Creating* and *Evaluating*. Bloom's original taxonomy was later revised by Anderson et al. (2001), who placed the processes of Creating at the highest end as more complex to Evaluating cognitive processes.

Responding to **learner diversity**

who & *how* we teach

learner lifeworld
- embed open, dialogic & continuous processes (Kalantzis & Cope, 2016)
- welcome & integrate learner everyday experiences, perspectives, thoughts, values, feelings, etc into learning (Reeve, 2009)

learner readiness
- connect learner prior to new knowledge (Tomlinson, 2001; Gagne et al., 1993)
- build around a few core concepts (Tomlinson, 1998; 2001)
- offer material at different language levels around same core concepts

learner learning profile
- involve learners in a variety of learning pathways such as: experiencing, reflecting, thinking, acting (Kolb, 1984 in Kolb & Kolb, 2005)
- multimodal meaning representations, i.e. written language, oral language, visual, audio, tactile, gestural, spatial and representations to oneself (Cope & Kalantzis, 2009)

learner interest
- include learner interests in their learning (Tomlinson, 2003)
- create the conditions for the satisfaction of learners' basic affective needs

   Need for competence:
   - cultivate a growth mindset classroom culture: teach growth mindset, aim high for all, focus on process & learning; stress importance of mistakes (Haimovitz & Dweck, 2017)
   - design challenging tasks (Pintrich & Schunk, 1996)

   Need for belonging:
   - cultivate an open to diversity classroom culture (Kumar & Hamer, 2012)
   - design for learning with & from others: involve learners in collaborative work, sharing of diverse life-worlds, negotiation of different perspectives (Kalantzis & Cope, 2012)

   Need for autonomy:
   - cultivate an autonomy supportive classroom climate (Reeve, 2009)
   - offer choices, (Pintrich & Schunk, 1996)
   - involve learners in self-reflection (Kumar et al, 2018)

Figure 2.4: This figure depicts this PhD research rationale of how teachers can design learning elements that respond to the different categories of learner diversity as a result of the literature review synthesis

processes that could **invite learner subjectivity and life narratives** into the classroom and their learning. Kalantzis and Cope (2016) argue that the only way for a teacher to know learner profiles is to embed in the logic of a learning element processes that are *open*, *dialogic* and *continuous*. Such processes align with autonomy-supportive practices (Reeve, 2009), which welcome and integrate in learning learners' perspectives, feelings, experiences, interests, preferences and needs acknowledging

and appreciating learners' inner subjectivity as core for their learning and engagement through open, continuous and dual teacher-student and student-student interactions.

Learners' different readiness levels can only be addressed through the design of learning elements which attempt to connect learners' previous knowledge on the subject matter with new as it was described in the previous section. In the case of teaching English as a Foreign Language, this would mean offering material at different language levels around the same core concepts for students of different foreign language competency levels. Meaningful learning centering on core concepts and principles rather than a wealth of isolated facts to be memorized facilitates learning for all learners from struggling to advanced making it more relevant to their own lifeworld and allowing teachers to have all students in a classroom work on the same understandings differentiating only the level of concreteness to abstractness, simplicity to complexity, single-facetness to multi-facetness, closed to open-endedness, and dependence to independence (Tomlinson, 1998; 2001). The category of learner readiness level has strong implications for the design of meaningful learning elements as well since this category draws teachers' attention to learners' prior knowledge and experiences– a necessary starting point for making learning meaningful and relevant to the learner.

The category of **learners' different learning profiles** highlights the need for the provision of a variety of learning pathways to learners maximizing the chances that each learner will find that way an appropriate fit to their different preferences assuming beforehand that different learners have different learning profiles of strengths and weaknesses (Tomlinson, 2001). Gardner (2000) claims that educators can employ learners' capacity for representing knowledge in a number of ways to support learners' understanding of the topic by drawing multiple connections to the topic. Two of Gardner's (2000) '**multiple intelligences**' approaches to understanding is the identification of multiple entry points[2] to a topic, and the multiple

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[2] 1. the *narrative entry point*, which involves the learners in a topic-related vivid and dramatic story, conveyed in any symbolic form such as language or film; 2. the *numerical entry point*, for the learners who enjoy numbers, numerical relations and the quantitative aspects of things; 3. the *logical entry*

representations of the core ideas through a 'model language'. Gardner's Multiple Representations of a concept approach builds on the rationale that there are multiple possible representations of any given concept using different model languages, or else symbolic forms. This approach shares many similarities with the multimodal process of representational parallels in meaning of the multiliteracies theory of learning coming from the field of literacy education (see 3.5 below). The multiliteracies theory is a theory of semiotic transformation of meaning among a range of modalities: the written language, the oral language, visual, audio, tactile, gestural, spatial representations and representations to oneself (Cope and Kalantzis, 2009). In particular, learners in a process of understanding and making their own meaning of the world are expected to represent the same meaning in parallel multimodal representations through a process of transformation (Cope and Kalantzis, 2009). As a result, the multiliteracies theory engaging *multiple modes of representation* and semiotic transformation could give a practical solution to the question of how teachers can engage learners' multiple intelligences.

For teachers to address learners' different **learning styles** in alignment with Kolb's experiential learning cycle, they need to draw designs that do not engage students in *thinking* processes only – the usual mode of learning used in the traditional classroom – but also processes of *experiencing*, *reflecting*, and *acting*. The process of experiencing is described as the process of opening oneself up fully to the sensations and feelings of the direct experience that exists in the here and now (Kolb and Kolb, 2009). Thus, the content of this learning mode are sensations and feelings and it is inhibited by the thinking mode, which focuses learner attention too much on their thoughts. That way, it distracts attention from the feelings and sensations experienced at the present moment. On the other hand, experiencing is inherently linked with the

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point, which involves learners in finding the logic behind a presented content; 4. the *existential / foundational entry point*, which poses to learners deep questions about existence such as the meaning of love or hate; 5. the *aesthetic entry point*, which introduces the learners to the topic through various works of art; 6. the *"hands-on" entry point*, which provides the learners with an opportunity to work with physical materials, including activities like dancing, listening to a song, or designing; 7. the *interpersonal* entry point, which involves learners in learning in the company of others with activities like debating, arguing, or occupying various roles.

reflecting mode , which stands for the learners' conscious direction of attention. Thus, when learners consciously direct their attention to the feelings and external stimuli of the present moment, their concrete experience can be enhanced (Kolb and Kolb, 2009). Learner empowerment and development of their critical thinking and awareness through processes of reflection supports also the gratification of learners' need for autonomy.

Finally, with respect to **learner interest**, it is important that teachers plan to include in the learning process the learners' already developed interests. Well-developed interests, actually, stand for learners' strengths since, according to interest research, a well-developed interest is accompanied by well-developed knowledge in the relevant content area (Hidi & Renninger, 2006 in Hidi, 2006; Krapp, 2002 in Hidi, 2006). Thus, when teachers plan for interest-based learning, they pave the way for learners to feel competent, to further exercise and extend their capacities, and to feel connected to the learning taking place in the classroom. Research has shown that an individual's well-developed interest can help him or her overcome low ability and/or perceptual disabilities (Berninger and Hidi, 2006; Fink, 1998; Renninger et al.,2002 in Hidi, 2006).

What is more, teachers' communicative attitudes and behaviors play an important role in the creation of the appropriate affective conditions for the development of learners' intrinsic motivation (see 2.8.3). The design principles that guide learning elements design for the satisfaction of learners' basic affective needs for competence, autonomy and sense of belonging are the following:

a) the need for feeling competent can be satisfied through challenge after acknowledging learner readiness level and offering them appropriate support for their effective learning.

b) the need for feeling autonomous and self-regulated can be satisfied through the provision of choices, learner empowerment through processes of self-reflection and the inclusion of learner interests in the learning process.

Common DI strategies for giving students choices are strategies such as the *tic-tac-toe, RAFTs, menus, interest centers* and *independent projects.*

c) *the* need for feeling a sense of belonging can be satisfied through learner involvement in sharing of experiences and feelings, expression and negotiation of their different perspectives and the use of collaborative tasks. *Flexible grouping,* is a very often quoted DI strategy relating to this learning pathway.

2.10. Conclusion

The ultimate aim of this chapter was to explore the nature of DI and identify the necessary teacher competences for effective DI implementation in classrooms. The review of literature research on DI and inherently connected fields has led to the original synthesis by the researcher of an integrated and comprehensive model of DI to underpin this investigation, which is conceptualized along three distinct hierarchical levels, a) the affective level, b) the planning level, and c) the instruction level.

With respect to the affective level, teacher professional development programs on DI should aim at the development of teacher openness to diversity. In other words, the development of teachers' a) reflective engagement with diversity away from egocentric and stereotypical thinking through the development of a growing awareness of the existence of multiple perspectives, b) growth mindset away from beliefs in the fixed nature of human attributes helping them that way sustain the challenges of DI, believe in all their students potential to learn and grow, understand and interact with diversity more effectively, and c) autonomy-supportive instead of controlling behaviors so as to be able to create the appropriate affective conditions in the classroom to address all learners basic affective needs for feeling competent, autonomous and a sense of belonging.

With respect to the planning level, teacher professional development programs on DI should aim at the development of teachers' ability to design high-quality differentiated learning elements. This involves, firstly, following meaningful learning principles instead of rote learning principles such as i) connecting new with previous

learning, ii) focusing on concepts and the big ideas of the content area, iii) involving learners into higher order thinking processes and iv) reaching deep understanding so that new knowledge becomes usable and transferable to real-world contexts and new situations. Secondly, it involves designing to respond to learner diversity by i) integrating different learner lifeworlds into learning, ii) offering various learning pathways such as multimodal meaning representations, experiencing, reflecting, thinking, acting, iii) designing for challenge, iv) designing for choice , v) designing for learning with and from others, and vi)   cultivating an open to diversity classroom culture.

The following chapter presents Learning by Design (Kalantzis and Cope, 2004), a useful tool for facilitating teachers design high-quality differentiated learning elements around a whole repertoire of eight different knowledge processes. The third chapter draws explicit connections among the principles of DI presented in this chapter and Learning by Design shedding light to the underlying processes of differentiation with respect to lesson designing. The chapter finishes with the proposal of a combination of Learning by Design with another learning element design tool, Understanding by Design (Wiggins and Mc Tighe, 2005), so as to start designing after the identification of the crucial and critical concepts of the taught subject area.

Chapter 3:

Learning by Design: a Tool for Designing High-Quality Differentiated Learning Elements

3.1. Introduction

This study attempts to draw together two distinct research areas that of differentiated instruction and the Learning by Design pedagogical framework. By bridging these two areas, it is intended to demonstrate the ways that they complement each other and draw explicit connections between the two. The DI chapter gave answers pertaining to the *who*, *why* and the principles of *how* we teach in a differentiated manner and drew explicit relationships among them from a DI literature perspective. This chapter explores Learning by Design, a polyvocal pedagogy of diverse knowledge processes, whose main focus relates to the *how* of the specific practice of planning difference-sensitive curriculums (Kalantzis and Cope, 2004). This section attempts to draw explicit connections between the *who*, *why* and *how* of DI and the Learning by Design knowledge processes. The core rationale behind this merge refers to the second level of DI and suggests that LbD could be a useful *practice-focused* tool for the differentiating teachers to help them design high-quality differentiated curriculums by making explicit the whole repertoire of concrete different learning pathways available to them. DI and LbD are complementary to each other.

3.2. Learning by Design within the Greek context

The LbD framework (Kalantzis and Cope, 2004) was introduced to Greece in 2010 in the context of the Greek National New School Educational Reform (Act 3848/2010), whose aim was the design of a new national curriculum which would allow Greek teachers to act with greater autonomy as learning element designers following the principles of differentiated pedagogy with the clear intention of catering to the diverse needs of all learners within a classroom. As a result, the teacher guide of the New School Integrated Foreign Languages Curriculum explicitly suggests to the Greek

foreign language teachers LbD as a useful tool to use for differentiated learning element designs (Paidagogiko Institouto, 2012). In the spring of 2011, there followed an LbD pilot application phase with the aim of training teachers in the use of LbD for differentiating their instruction. The LbD pilot project, which lasted for three months, involved 43 primary and secondary school teachers of mathematics, science, social sciences and humanities from nine different schools of the Greek cities of Patras, Athens and Rhodes (Arvanitis and Vitsilaki, 2015). It is important to note that foreign language teacher training was absent from this pilot application phase, which was never continued due to the heavy social and economic crisis of that time resulting in teachers' rapidly decreasing wages and public funding for education.

3.3.   Learning by Design: a reflexive pedagogy of multiliteracies

Learning by Design has its origins in the New London Group's programmatic manifesto of *multiliteracies* (New London Group 1996). The New London Group, convened by Mary Kalantzis and Bill Cope in September 1994, consisted of ten educators who came together in a week-long meeting to discuss and explore literacy education's changing nature in face of the pronounced broader social changes of globalization and technology expansion which rendered more traditional conceptions of literacy as a single, standard form of alphabetical language and its relevant literacy pedagogy practices of direct instruction largely anachronistic (Cope and Kalantzis, 2000; Cope and Kalantzis, 2015). The result of these group workings has been the construct of *multiliteracies,* referring to the need (a) to bring multimodal texts into the curriculum and classroom and acknowledge that in the era of mass media and internet expasion meaning making is becoming increasingly multimodal, i.e. written-linguistic modes of meaning interface with oral, visual, audio, gestural, tactile & spatial patterns of meaning, and (b) to acknowledge that in the era of globalisation, communication is characterised by significant cross-cultural differences in a variety of contexts, i.e. cultural, social and domain-specific ones, and requires from learners to become able to negotiate differences in patterns of communication and meaning-making from one context to the other.

As a response to the 'how' question of a pedagogy of multliteracies, the New London Group identified *Learning by Design (LbD),* a polyvocal pedagogy, which systematized the knowledge of diverse learning theories into a coherent and unified framework of diverse learning experiences. The framework brought together four different pedagogical approaches, namely situated practice, overt instruction, critical framing, and transformed practice, which evolved into the LbD cycle of eight knowledge processes, i.e. *experiencing the known* and *the new*, *conceptualising by naming* and *through theory*, *analysing functionally* and *critically*, and *applying appropriately* and *creatively* (Cope and Kalantzis, 2000; Cope and Kalantzis, 2015). This multiliteracies theory of pedagogy has gradually evolved through the years starting from the *Learning by Design* project in Australia in 2000 with the support of a number of grants from the Australian Research Council and later from the Institute of Educational Sciences in the US Department of Education and the Bill and Melinda Gates Foundation (Cope and Kalantzis, 2015). It started with the development of a Microsoft Word lesson documentation template around the eight LbD knowledge processes, in 2008-2010 took the form of an online web planner, and in 2010 it was moved into the *Scholar* online learning platform of the University of Illinois (Cope and Kalantzis, 2015). These Microsoft Word and online LbD templates were used by teachers to collaboratively develop Learning Modules, i.e. teaching plans organised around the eight knowledge processes, which would later teach, then make adjustments based on their teaching experience, and, finally, share with the educational world these lasting records of real-classroom pedagogical experiences.

It is important to note that Kalantzis and Cope (2004) in their Learning by Design pedagogical framework explicitly identify *belonging* and *transformation* as two essential conditions for effective learning to take place. The starting point for successful learning is for learners to develop a sense of belonging to learning and the learner community. For example, through the process of *Experiencing the Known,* learners' different needs, expectations, interests, motivations and aspirations can be carefully identified and supported, and learner identities can be positively affirmed by the community (Kalantzis & Cope, 2012). On the other hand, the objective of successful learning is transformative action which can be realised through the

knowledge process of *Applying Creatively*. Kalantzis and Cope (2004) define this process in terms of Vygotsky's Zone of Proximal Development (ZPD) as learners travelling out of their comfort zones and within their ZPD along either a depth axis through challenging of everyday assumptions, or a breadth axis through new experiences. According to Vygotsky, meanings are first constructed interpersonally through social interaction with significant others such as the teachers, and only later intrapersonally within an autonomous individual mind (Kalantzis & Cope, 2012). Thus, the role of the community of learners is recognised as core to the individual's transformation. It is through communication and collaboration with others that learners will develop their 'collaborative competence', the capacity to share their own experience and knowledge with the group contributing at the same time to group knowledge building through collaborative learning (Kalantzis & Cope, 2012).

The Learning by Design pedagogy is a reflexive pedagogy (Cope and Kalantzis, 2015) attempting to bring to teachers' conscious reflection the nature of knowledge and the conditions of knowing developing, thus, their reflexivity and helping them make conscious learning decisions which build on different learners' identities. Archer (2012 in Feucht et al, 2017) define reflexivity as an internal dialogue that leads to action for transformative practices in the classroom. Feucht et al. (2017) claim that reflection on epistemic cognition, that is beliefs and cognition of how people acquire, understand, change and use knowledge, in the specific context of a teacher's teaching practices could be identified as a process of reflexivity. In this context, the LbD knowledge processes are mainly a metalanguage of learning, helping teachers become more reflective and active practitioners, and at the same time guiding learners through diverse learning experiences. In Kalantzis and Cope's (2004, p.73) words it is 'an attempt to develop a vocabulary of learning that can be used by teachers for the documentation of locally developed, difference-sensitive curriculum'.

Cope and Kalantzis (2015, p.6) identify *didactic pedagogy* and *authentic pedagogy* as the two archetypical poles of pedagogy, and define 'reflexive' as 'neither didactic nor authentic, but both' going beyond *either-or* pedagogical wars and where insights and practices from *both* pedagogical traditions come together to create a different

balanced whole, a whole repertoire of learning activity types. The two authors take extra care to stress the reciprocal connection and interplay between the different types of learning highlighting the fact that it is this building of knowledge processes on each other that produce the desired learning outcomes. In accordance with Cope and Kalantzis (2015), Alexander (2017) writing about reflection and reflexivity in practice versus in theory dismisses the polarized classification and designation of 'traditional' approaches as inherently negative while 'constructivist' ones as inherently positive arguing that it is *the context t*hat determines each practice's inherent value – it is the when, how, why, how often, for whom and what task that determines the choice of the appropriate learning pathway.

Research has shown that the use of LbD as a tool for the analysis and documentation of pedagogy by teachers helps them develop higher levels of metacognitive thinking and meta-awareness of their teaching and student learning resulting in more conscious pedagogical choices (Morgan, 2010; Neville, 2010; Van Haren, 2010) and leading learners into deeper learning and accommodating learners' diverse learning preferences. Hood (2015) research on a sample of Australian, American and Greek teachers' reflections on implementing LbD revealed that while it was hard to learn at the beginning, teachers strongly endorsed it for gaining teaching expertise through engagement in reflective teaching and valuable collaboration with other teachers. Abrams (2015) research found that LbD helped to empower early-career educators to perceive themselves as agents of change and develop their reflexivity that honored a culture of collaboration, resilience, openness, multimodalities and agency in the context of an online participatory learning environment rooted in the LbD knowledge processes. Arvanitis and Vitsilaki (2015) study on the LbD pilot project in Greece revealed that while teachers felt that it was time-consuming and difficult to implement for every lesson, the vast majority of the participant teachers felt that LbD extended their repertoire of teaching approaches, it contributed immensely to collaboration with colleagues. At the same time the great majority of teachers found the LbD pedagogical theory and the planning space it offered very useful claiming that their professional learning had been significantly advanced.

Research reveals LbD's similarly significantly positive contribution to student learning and engagement. For example, Hood (2015) research showed that teachers' who implemented LbD in their classrooms reported on students' initial confusion with the formatting of the lesson, which although resulted in student improved learning outcomes, increased engagement and on-task behaviour along with student empowerment. Van Harren (2015) study on how LbD engages learner diversity on a sample of four students and two teachers found that learning structured around the LbD knowledge processes succeeded in a) connecting all students' learning to their subjective lifeworld, b) scaffolding their learning so that all students achieved equivalent outcomes despite their different starting points, c) ensuring intellectual quality and helping three out of four students meet intellectual challenges, and d) intrinsically motivate all learners and empowering them through experiences of success, choice and working collaboratively. It is interesting to note that with respect to learner diversity and DI, Arvanitis and Vitsilaki (2015) found that while LbD enhanced student outcomes and engagement, 41% of teachers reported that the effect of LbD on their DI was 'limited' or 'not existent', which according to the researchers reveals the Greek teachers difficulty in identifying and dealing with learner diversity effectively.

3.5. Learning by Design: the knowledge processes

Pedagogy is learning by design, that is, conscious, pre-planned and structured learning (Kalantzis and Cope, 2014) where the teacher makes a conscious choice of tasks sequencing them accordingly. According to Cope and Kalantzis (2015), LbD represents a typology of knowledge processes (see Fig. 3.1), which represent the whole range of pedagogical moves, or else different 'things learners 'can do to know'. This typology of learning activities can be used by teachers while designing their students' learning in order to reflect on the whole range of different existent conditions of knowing and complement their current practice with a broader repertoire of knowledge processes while carefully ordering. In fact, the LbD knowledge processes are by no means a 'sequencing prescription'. Teachers can scaffold their students' learning choosing

which knowledge processes to use and in what order making a conscious choice according to the learning context and the particular needs of their students.

The Learning by Design Knowledge Processes
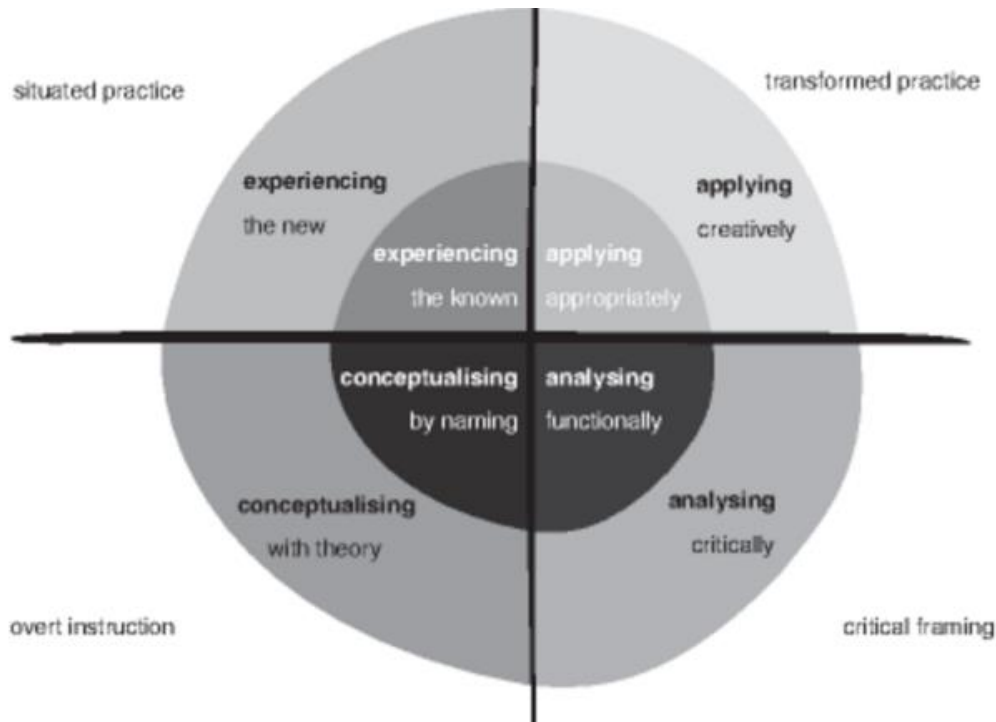
Figure 3.1. This figure is Cope & Kalantzis (2015) construction depicting the cycle of the Learning by Design knowledge processes under the pedagogical moves each process represents

3.4.1. Experiencing

Experiencing is a situated practice pedagogical move placed among the educational 'progressivism' traditions (Kalantzis and Cope, 2000). The conditions for such learning to take place involve immersion in the real world of everyday life such as learners' personal experiences, interests, exposure to real world facts and data (Cope and Kalantzis, 2015). In other words, learning is situated in *learners' lifeworlds* and experiencing refers to out-of-school real life experiences which can take the form of excursion, simulation, textual, visual or audio representation. That way, learning is grounded on different learner subjectivities taking into consideration different

learners' affective and sociocultural needs and identities (Cope and Kalantzis, 2000; 2009). There are two types of experiencing:

3.4.1.a. Experiencing the Known

Experiencing the known is a knowledge process that brings into the learning situation what is already familiar to learners such as their own, subjective and diverse everyday and familiar experiences, prior knowledge, community background, personal interests and perspectives (Cope and Kalantzis, 2015). Learners are then encouraged to read deeply into their familiar experiences and reflect on experiences, what they already know, their interests, to become aware of the nature of their thinking and the sources of their knowledge, to interrogate their perspectives and what they might do to extend their knowledge (Kalantzis and Cope, 2004; 2008; Cope and Kalantzis, 2009; Cope and Kalantzis, 2015). This process involves lots of reflective work and explicit identification through articulation of the observed aspects of the self or social and environmental conditions of one's own and others' diverse life-world experiences as a starting point in a journey of learning involvement and transformation within a community of learners, which may strengthen or unsettle one's world by uncovering its limitations and contradictions (Cope and Kalantzis, 2015).

3.4.1.b. Experiencing the New

Experiencing the new is a knowledge process that immerses the learner in a new, unfamiliar from the learner's perspective area of experience, which could be either a *real* place, community, situation or a *virtual* experience of presented texts, images, data, facts, etc. building on what is already familiar to them through scaffolding activities (Kalantzis and Cope, 2004; 2008; Cope and Kalantzis, 2015). Scaffolding learning means that teachers should take extra care to immerse learners in new knowledge or experiences within their 'zone of proximal development', according to Vygotsky, where parts of learning are familiar while the parts that are unfamiliar are made intelligible with the support of peers, teachers, or facilitative texts (Cope and

Kalantzis, 2015). That way, learners are drawn into new horizontal learning of knowledge expansion.

Experiencing the new is underlain by the epistemology of empiricism which builds on the premise that knowledge builds on extensive and intensive observation of the world in the fashion of the 'scientific method' where the scientist observes, makes propositions, collecta data and establishes facts or evidence that confound mere subjective opinions (Cope and Kalantzis, 2015). Thus, the knowledge actions involved in experiencing the new could be discovery-learning which asks for observation of the unfamiliar, reading new texts, collection of new data within each learners' zone of proximal development (Kalantzis and Cope, 2008; Cope and Kalantzis, 2009), or, 'recording, describing, measuring, testing, experimenting, interviewing, or surveying' (Cope and Kalantzis, 2015, p. 25).

3.4.2. Conceptualizing

Conceptualizing is an overt instruction pedagogical move stemming from the bulk of teacher-centred transmission pedagogies such as direct instruction (Kalantzis and Cope, 2000). Contrary to the transmission pedagogies, though, learners are active conceptualizers drawn into a transformational journey away from the experience of the lifeworld and into meaning-making processes of new depth through an examination of the underlying system and its structure (Cope and Kalantzis, 2000). Conceptualizing involves the development of abstract, generalizing concepts and their theoretical synthesis into a coherent whole indicative of learners' development of deep understanding (Cope and Kalantzis, 2015). In Cope and Kalantzis' (2015. p.19) words: *the world comes to have deeper meanings which are not immediately obvious, some of which may even be counter-intuitive and challenge common sense assumptions.* There are two types of conceptualizing:

3.4.2.a. Conceptualizing by Naming

Conceptualizing by naming is a knowledge process that involves the learners in concept development, that is, abstract, generalizing terms deducted after identification of similarities and differences, drawing distinctions, and categorization with labels (Cope and Kalantzis, 2015). The aim is to name the particular and also abstract something general from it constituting the underlying concepts of the disciplinary system (Cope and Kalantzis, 2015). This process of meaning abstraction going from the particular to the general helps learners develop high levels of semantic precision and explicitness in defining, which adds depth to the learners' knowledge (Kalantzis and Cope, 2004; 2008). The knowledge process of conceptualizing by naming is underlain by the epistemology of categorization, the main mechanism of meaning making through categorization of things (Cope and Kalantzis, 2015).

3.4.2.b. Conceptualizing with Theory

Conceptualizing with theory is a knowledge process that involves the learners in a process of identifying patterns in their experience and organising the concepts they have arrived into a coherent interpretative framework, a theory, which can be then transferred and applied to new situations due to its level of generalization (Kalantzis and Cope, 2008; Cope & Kalantzis, 2009). This process of organizing knowledge into a coherent system makes learner understanding explicit and conscious highlighting realities that could go unnoticed in an unreflective experience of the life-world (Kalantzis and Cope, 2004). The resulting conceptual models, or else, the theories, showing the semantic relations of concepts may be represented in language or in visual-iconic diagrammatic form.

Conceptualizing with theory is underlain by the epistemology of schematization which refers to the resulting schemas of theorizing and synthesizing the concepts of the relevant academic disciplinary area (Cope and Kalantzis, 2015). In didactic education, these schemas, that learners actively create weaving between the experiential and the conceptual, would make up the rules and the laws of the academic discipline that teachers transmit and learners have to acquire (Cope and Kalantzis, 2015).

3.4.3. Analysing

Analysing represents the more recent tradition of critical framing helping learners place the acquired knowledge into a historical, social, cultural, political, ideological frame (Cope and Kalantzis, 2000). This involves the examination of cause and effect, structure and function, the inter-relation of the constituent elements of something, identification of purposes, interpretation of perspectives and the intentions, interests served and their contextualisation (Cope and Kalantzis, 2015). This contextualization not only reveals the relationships of power in the social practice of particular systems of knowledge but also helps learners evaluate them (Cope and Kalantzis, 2000; 2009). Learners' interrogation of contexts and their purposes gives breadth to their lifeworld perspectives (Kalantzis and Cope, 2000). This process of constructive critique within its cultural context helps learners gain personal and theoretical distance from their learning and become capable of creatively extending this learning in the transformed practice stage (Cope and Kalantzis, 2000).

3.4.3.a. Analysing functionally

Analysing functionally is a knowledge process that develops learners' critical capacity. It involves them in high levels of reasoning analysing logical connections, deducing, inferring, predicting, establishing functional relations of cause and effect (Kalantzis and Cope, 2008; Cope & Kalantzis, 2009). In Cope and Kalantzis (2015, p.20) words:

> *Analyzing Functionally is a Knowledge Process examining the function of a piece of knowledge, action, object or represented meaning. What does it do? How does it do it? What are its structure, function, relations, and context? What are its causes and what are its effects?*

Such pedagogical moves are underlain by the epistemology of functionalism and can well be applied to multimodal knowledge representations and grounded on experiential knowledge of direct personal or virtual experience (Cope and Kalantzis, 2015).

3.4.3.b. Analysing critically

Analysing critically is a knowledge process that involves learners in lots of critical interrogating concerning the interests, the motives and the ethics behind different knowledge claims (Kalantzis and Cope, 2008). Such interrogation guides learners into critical interpretation and evaluation of human perspectives, motives and action preparing learners for transformed practice in the world (Kalantzis and Cope, 2008; Cope & Kalantzis, 2009). Cope and Kalantzis (2015, p..) characteristically write that:

> *For any piece of knowledge, action, object or represented meaning, we can ask the questions: Whose point of view or perspective does it represent? Who does it affect? Whose interests does it serve? What are its social and environmental consequences?*

This knowledge process is underlain by the epistemology of interpretation since it interrogates and attempts to interpret human subjectivity such as interest, purposes, biases, and intent within its sociocultural context, in contrast to the previous analysing functionally knowledge process, which attempts to explore the world in a more objective way (Cope and Kalantzis, 2015).

3.4.4. Applying

Applying is a pedagogical move which more closely relates to strategies used for transferring learning and putting theory into practice (Cope and Kalantzis, 2000). It is a knowledge process which involves learners in experiences of acting out in the world on the basis of their experiential, conceptual and critical learning and learning back something new from it (Cope and Kalantzis, 2015). It is defined as a reflective practice, where learners are given the chance to apply reflectively the knowledge they have acquired and carry out new practices outside the school setting suiting their personal goals, interests, perspectives and values (Cope and Kalantzis, 2000). It serves the important role of applying knowledge into practice and testing its validity within the

intricacies and complexities of real world situations (Cope & Kalantzis, 2009). There are two types of applying:

3.4.4.a. Applying appropriately

Applying appropriately is a knowledge process that involves the learners in learning by doing, that is transferring their theoretical knowledge into practice. In carefully designed and scaffolded activities, the teacher guides learners into realizing knowledge in a predictable pre-specified manner within a specific 'real-world' setting (Kalantzis and Cope, 2004; 2008; Cope & Kalantzis, 2009). This knowledge process underlain by the epistemology of pragmatism brings learners back to the world of lifeworld experience after reflecting on the self and their previous experiences, conceptualizing schematically and critically analysing knowledge (Cope and Kalantzis, 2015). The focus is on processes and products of practical activity in a way that they meet expected standards or conventions.

3.4.4.b. Applying creatively

Applying creatively is a knowledge process that goes beyond the mere putting theory into practice and relates to more challenging aspects of practice such as problem-solving, innovating, rearranging meanings in new ways possibly in new contexts, imagining new perspectives and possibilities beyond what is known, creatively mixing and matching the familiar into unusual and original ways (Kalantzis and Cope, 2008). This process allows the real world to come into the classroom, or else, allows learners to go out into the real world and possibly make an intervention to it in accordance to their interests, experiences and aspirations (Cope & Kalantzis, 2009). Applying creatively is underlain by what Cope and Kalantzis (2015) call the epistemology of innovation highlighting the creative and innovative aspects of knowledge when it is recombined to express novel meanings in novel situations.

3.5 Using *Learning by Design* to differentiate instruction

This section attempts to draw explicit connections between the who, why and how of DI and the Learning by Design knowledge processes. LbD lends to DI its pedagogical variety and explicit knowledge processes and DI lends to LbD its rationale for making it a difference-sensitive curriculum. In particular, this study has shown that going up in the pyramid of DI after teachers' openness to diversity mindset, the second foundational level for effective DI is the design of a high-quality learning element according to principles of meaningful learning for all students. At the same time, the DI literature review has revealed gaps in the theoretical framing of DI and an identified need to shift the focus from superficial aspects of DI such as the use or nonuse of certain materials and activities to the underlying processes of effective differentiation and teachers' deliberate and well-thought decision making with respect to differentiated practice.

To address this need, LbD with its whole repertoire of pedagogical moves and explicit knowledge processes could focus teacher attention exactly on the underlying processes of DI and facilitate teachers become reflective and active practitioners able to guide learners through diverse learning experiences. At the same time, LbD could function as a useful learning element template for the design of difference-sensitive curriculums and facilitate practice-focused teachers at the second level of DI, that of planning high-quality differentiated curriculums inclusive of all learner needs.

In reality, both DI and the pedagogy of LbD share a core starting point. They both acknowledge learner diversity and student subjectivity as core for effective teaching and learning. It is indicative that this study found necessary to complement the DI literature common conceptualization of learner diversity along the cognitive-focused variable of student readiness, learning profiles and interest with Kalantzis and Cope's (2016) concept of 'learner lifeworld' as more accurately and holistically capturing the experiential essence of learner subjectivity and identity within its real-life context. Thus, taking different individual student lifeworlds – such as experiences, insights, interests, cultural and social backgrounds - into consideration, LbD functions as a pedagogical approach for teaching at the individual level and inclusive of diverse student needs and ways of knowing (Van Haren, 2015).

What's more, LbD is the New London Group's answer to the question of how to teach multiliteracies, which refers to the acknowledged need to bring multimodal texts into the curriculum and classroom. In essence, with the construct of multiliteracies the New London Group recognize that literacy is not single and restricted to the alphabetical symbol system, but that it interfaces with oral, visual, audio, gestural, tactile and spatial symbol systems. On the other hand, DI coming from a different starting point, that of acknowledging that human intelligence is not a single linguistic or logical-mathematical human ability, also recognizes the need for the inclusion of multimodal learning pathways in the curriculum. In other words, the needs of learners with different profiles of intelligences can better be addressed with the inclusion in teaching and learning of different multimodal symbol systems of meaning making.

The second aspect of multiliteracies refers to the acknowledged need to develop learners' ability to negotiate with difference in the context of a globalized world where communication is characterized by significant cross-cultural differences in a variety of contexts. On the other hand, DI highlights the need for the development of teachers' ability to negotiate with difference in the classroom so as to be able to develop such an ability in learners. Thus, this study hypothesizes that it takes differentiating teachers with a developed openness to diversity who will be able to focus learners' attention to different patterns of communication and meaning making from one context to another and, thus, gradually grow interculturally competent individuals.

3.6. How Learning by Design responds to learner diversity following DI principles

This section explicitly describes the ways that the LbD knowledge processes address in practice the principles of DI in connection to the variables of learner diversity. In other words, it elaborates on the ways LbD can help teachers design meaningful curriculums offering a variety of learning pathways capable of integrating their different learners' lifeworlds and create the conditions for addressing the learners

basic needs through designs which offer challenge, choice and support learning with others.

3.6.1. Designing a meaningful learning element

Learning by Design is a learning element design template for meaningful learning since its knowledge processes guide teachers in the design of meaningful learning curriculums. In particular, the two processes of experiencing, the known and the new:

a) guide teachers to design curriculums that carefully connect learners' prior knowledge on the taught topic with new knowledge which mostly take the form of learner real-life experiences around the taught topic with learning that is situated in learners' lifeworlds,

b) involve learners in higher order thinking processes and active construction of meaning through the processes of concepualising, analyzing and applying. Throughout all of these processes, the learner is actively involved in higher order thinking processes of logical reasoning, categorization, schematization, functional and critical reasoning, appropriate and creative application of learning so as to further extend that knowledge into the real-world of experience,

c) facilitate teachers to design curriculums that help learners reach deep understandings that result in knowledge that becomes usable and transferable to real world contexts. It is particularly the knowledge processes of conceptualizing with theory that helps learners organize the learned concepts into a coherent whole and then transfer it is real world contexts through the processes of application.

3.6.2. Designing for a variety of learning pathways

The Learning by Design pedagogical moves of experiencing the known and the new, of conceptualizing, analyzing and applying inherently address learners' diverse

learning styles and needs for different ways of knowing. There is an inherent compatibility between Kolb's experiential learning cycle and LbD knowledge processes, where a) the reflective nature of Experiencing the Known relates to Kolb's process of reflecting, b) the pragmatic nature of Experiencing the New relates to Kolb's process of experiencing, c) the Conceptualising and Analysing processes which involve lots of thinking and logical reasoning relate to Kolb's process of thinking, and, finally, d) the LbD transformed practice processes of Applying relate to Kolb's process of acting connecting the learner back with the world of experience from a new deeper understanding. All these LbD knowledge processes can be blended with multimodal texts and meaning making processes such as alphabetical, oral, visual, audio, gestural, tactile, spatial and social so as to address different learner intelligences.

3.6.3. Integrating different learners' lifeworld into learning

The need for open-ended dialogic curriculum designs that manage to welcome and integrate learners' different lifeworlds into learning is most appropriately addressed by the Experiencing the Known and Applying Creatively knowledge processes in the LbD framework (Kalantzis and Cope, 2016). Experiencing the known welcomes learners to bring their own lifeworld experiences, perspectives, feelings, interests, preferences and needs which inherently integrates them into the curriculum and learning by building and coming back on those articulated lifeworlds with the rest of the LbD knowledge processes. Then, the Applying Creatively knowledge process inherently guides learners to go back to their own lifeworlds and apply what they have learned in the classroom. Thus, learner subjectivities are continually embedded into the logic of the curriculum itself inviting student diversity into the classroom and their learning, and facilitating open, continuous, dialogic teacher-student and student-student interactions (Kalantzis and Cope, 2016). Indeed, Van Haren (2015) research shows that an important dimension of LbD for the engagement of learner diversity is the connection it offers to learner lifeworlds and their subjectivities.

3.6.4. Designing for challenge

The Learning by Design knowledge processes seem to satisfy all necessary conditions for learners to experience challenge and feel competent through scaffolded learning. Starting from the experiences of known, which acknowledges what is already familiar to them, the rest of the LbD processes of experiencing the new, conceptualizing, analyzing and applying carefully build on each other so as to support student learning through challenging intellectual learning processes. Indeed, Van Haren (2015) research on the ways that the LbD managed to engage learner diversity found that all the participant students in her research described how they liked the support they got by scaffolded learning, the great majority of students stated that they enjoyed thinking and meeting intellectual challenges, while all of the students managed to learn effectively and achieve equivalent outcomes.

3.6.5. Designing for choice

The Learning by Design knowledge processes offer teachers the space to include learner subjectivity and interests particularly in the processes of experiencing the known and applying creatively, which more imminently connect to learners' lifeworlds. On the other hand, the knowledge process of analysing critically satisfies the conditions of critical framing pedagogy which aims at learner empowerment through interrogation of contexts and purposes, interests and perspectives. What is more, the construct of multiliteracies which is inherently connected to LbD guides teachers to the inclusion of various choices in terms of multimodal meaning making for learners throughout all of the LbD knowledge processes. Importantly, Van Haren (2015) found that another important aspect through which LbD engaged learner diversity in her research was that of student agency. All participant students stated that they liked success, choice and working collaboratively with others – all the dimensions of students feeling intrinsically motivated and experiencing more agency over their learning.

3.6.6. Designing for learning with others

It is important to note that Kalantzis and Cope (2004) in their Learning by Design pedagogical framework explicitly state that the starting point for successful learning is for learners to develop a sense of belonging to learning and the learner community. In particular, the process of experiencing the known welcomes learners to share their unique experiences, interests, perspectives, etc with others within the community of learners in the classroom and possibly feel connected and accepted, and then apply them creatively into the real-world of their broader local communities. Then, throughout the rest of the knowledge processes of experiencing the new, conceptualising, analysing, and applying learners can and should be involved in collaborative meaning making by expressing and negotiating their different perspectives. Kalantzis and Cope (2012) explicitly acknowledge the role of the community of learners as core to the individual's transformation since it is through communication and collaboration with others that learners will develop their 'collaborative competence' and construct meanings through social interaction with others and then intra-personally.

3.7. Understanding by Design and Learning by Design: two complementary learning element design models

LbD main focus is on *how to teach* responsively to learner diversity. Tomlinson and Mc Tighe's (2006) partnership, though, where DI principles have been integrated with Understanding by Design (UbD), a learning element design model developed by Grant Wiggins and Jay McTighe (2005), stress the need for using UbD to complement LbD for the design of high-quality differentiated learning elements. UbD complements DI by showing teachers how differentiation can start with a high-quality curriculum, where *the crucial and critical concepts* of the content area have been primarily identified.

UbD main focus is on *what to teach* and the *assessment evidence* that teachers should gather to continually inform and guide their teaching. It assists teachers in their planning of powerful learning elements for all learners through a template of a three-stage backward design process based on Ralph Tyler's (1949) original concept of

planning learning elements backward starting from the desired results of learning. In the first stage, the teacher identifies the desired results, in other words, sets the objectives of teaching and learning, which center around the 'Big Ideas' and the 'Essential Questions' of the content area. The second stage of the model focuses on assessment and the evidence for learning and understanding that the teacher plans to look for. The model distinguishes among two types of assessment: a) performance tasks, which guide learners in transferring their learning to new and authentic situations as a means of assessing understanding, and b) other evidence such as tests, observations, learner work samples that inform teachers about what learners know and are able to do. With respect to differentiation, it is important to note that the teacher may provide learners with various options to show their understanding and knowledge in accordance to their needs but using the same criteria for all. In this backward learning elements design, the third stage during planning is to plan for instruction, that is, the differentiated activities that will teach to the learners' different needs so as to ensure that all students have equal opportunities to excellence.

Important, though, these stages are for planning a powerful learning element, teachers lack any clear guidance for the third stage, the design of the differentiated instruction activities that will facilitate all learners reach the learning objectives of the curriculum. The most appropriate template to fulfill that gap appears to be the Learning by Design (LbD) template by Kalantzis and Cope (2004). LbD is also a tool for guiding teachers during the process of learning element design with an emphasis on pedagogy. The strength of the LbD framework consists in making pedagogy explicit and coherent through the identification of a cycle of eight knowledge processes, which represent fundamental ways of knowing, such as experiencing, conceptualizing, analyzing or applying. It is this structurally inherent variety in pedagogy which makes it a promising tool for teachers to use in order to guide them design effective differentiated lesson units. Thus, both UbD and LbD are learning element design templates for teachers. However, they seem to be quite different and complementary since each focuses and makes explicit different stages of the learning element design process. UbD stresses the design of a high-quality learning element with objectives that focus on essential knowledge and deep understandings and coherent assessment

evidence. On the other hand, LbD focuses on pedagogy and makes explicit a variety of learning processes that a teacher can use in planning instruction. Figure 3.2 shows the resulting curriculum-design template for planning the *what* and *how* of effective DI, a combination of UbD and LbD.

3.8. Conclusion

This chapter has attempted to bring together DI and LbD polyvocal pedagogy (Kalantzis and Cope, 2004) by making explicit their complementary nature. The LbD template is a useful practice-focused tool, which helps teachers with the second level of DI, that is, the design of high-quality differentiated curriculums. In essence, the LbD knowledge processes help teachers take the time to reflect on student polyvocal learning and take conscious well-thought decisions about their different learners learning needs – what constitutes the essence of a differentiating teacher– in their attempt to design meaningful and differentiated curriculums. Towards this end, LbD, whose focus is on the processes of learning, can be complemented by UbD (Wiggins & McTighe, 2005), whose emphasis is placed on the type of knowledge that a high-quality and meaningful learning element should focus on drawing teachers' attention to the need to identify the essential knowledge, or else, the core concepts of the content area before deciding on the learning processes.

The next chapter focuses on teacher professional development on DI stressing the need for transformative learning in order for teachers to be able to differentiate

Combining Understanding by Design & Learning by Design for high-quality differentiated learning element designs

1 Identify big ideas & essential questions

2 Identify objectives

3 Identify assessment: evidence of effective learning

4 Instruction:

experiencing the new

applying creatively

experiencing the known

applying appropriately

conceptualising by naming

analysing functionally

conceptualising with theory

analysing critically
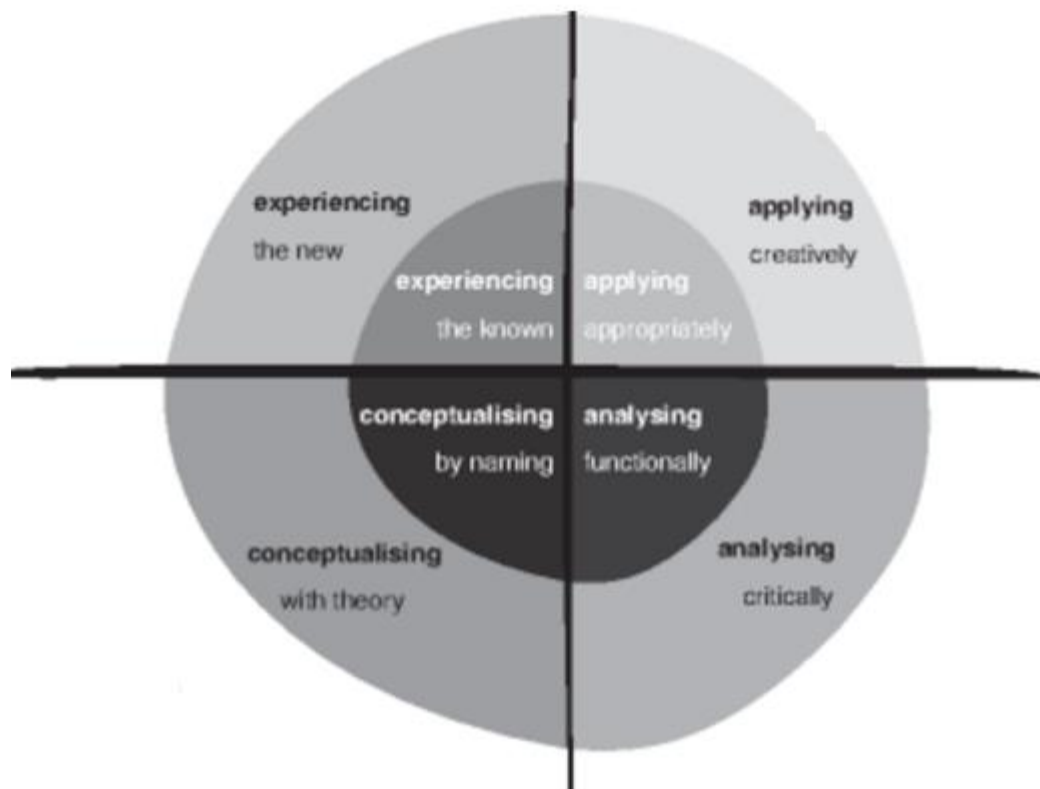
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Figure 3.2. This figure depicts the combination of Understanding by Design (Wiggins & McTighe, 2005) and the Learning by Design (Kalantzis and Cope, 2004) curriculum-design templates to facilitate teachers design high-quality differentiated learning elements

their instruction effectively. It delineates the aims and expected outcomes of any teacher professional development program on DI, and proposes the use of DI

principles acknowledging teachers' different learning needs. In addition, the LbD pedagogy is also proposed as a useful template helping teacher educators design diversity-sensitive curriculums for differentiated teacher professional development on DI responding to different teacher needs.

Chapter 4

Teacher Professional Development on Differentiated Instruction

Images and ideas about teacher professionalism, and even about the nature of teaching itself, linger on from agendas of other times – remaining as real forces to be reckoned with in the imaginations and assumptions of policy-makers, the public and many parts of the teaching profession itself. Teaching is not what it was; nor the professional learning required to become a teacher and improve as a teacher over time [emphasis added] (Hargreave, 2000, p.153).

4.1. Introduction

This chapter puts the focus, firstly, on the issues surrounding effective TPD in general and, secondly, TPD on DI in particular, secondly, before making a proposal of a differentiated model of TPD on DI based on the propositions drawn from the literature review on DI and the pedagogical framework of LbD in chapters 2 and 3 of this study. In particular, it is acknowledged that research on TPD has made important progress but still struggling to conceptualize holistically effective TPD, which is a complex process of many variables involved. One of the biggest problems identified with the field concerns the extent that teacher personhood, involving teacher beliefs, understandings, needs, personality and other, have gone unnoticed placing emphasis on teaching techniques and methods instead. Towards that direction, the study is situated among research such as Darling-Hammond (2003), who stands up for teaching professionalization as a reform approach to a more equitable quality education where professionals are knowledgeable autonomous and peer networked, and Korthagen (2017), who focuses attention on individual teacher learning needs. In accordance to these voices, research shows that the greatest amount of variables that can either facilitate or hamper teachers' effective implementation of DI relate to the nature of teachers' subjective beliefs in relation to diversity and willingness to reflect, knowledge about students and their subject matter, experience, reflection, and feelings of control over their teaching.

Nevertheless, this chapter goes on to explain that what remains the biggest challenge for quality differentiated education is its inability to change and practice alternative ways of teaching both at the level of practitioner teachers and teacher education due to constraining individual and collective prior experiences of what learning and teaching are and how they are practiced. This fact has important implications for TPD on DI taking into consideration that the majority of teachers have experienced traditional, didactic forms of schooling. What all these add up to is the need for TPD on DI to be grounded on principles of transformative learning. Thus, this study uses transformative learning (Mezirow, 1996; 1997) as a general framework to understand the barriers that current educational cultures place on teacher practice, to identify the changes that different teachers must pass through in order to be able to effectively implement DI in their classrooms and to explore the necessary processes and conditions that a TPD program on DI should employ in order to effect those changes in its participant teachers. The end-result is the proposal of an original synthesis of *polyvocal transformative* TPD on DI assuming that teachers to be able to teach for diversity effectively need to *experience* this new learning paradigm of DI and learn within a culture of differentiated education through multiple learning pathways, which at the same time *address their own individual learning needs*.

A framework that quite satisfactorily addresses all of the above conditions for TPD on DI is the Learning by Design (LbD) framework of a polyvocal pedagogy (Kalantzis and Cope, 2008), which is a diversity-sensitive framework that employs processes of both meaningful and transformative learning, and which helps build high-quality differentiated learning experiences and interactions for teachers within the context of an online community of practice (CoP) (Wenger et al, 2011).

4.2. Teacher professional development: a complex process

Teacher learning has been connected to the use of a variety of terms, such as teacher in-service training, staff development, professional learning, professional

development, or even, teacher change. Some of these terms are more common nowadays than others. The once popular acronym INSET is less common but still used today to denote all in-service learning (O'Brien and Jones, 2014). As Villegas-Reimers (2003) notes 'in-service training' and 'staff development' for years were the only available form of teacher 'professional development', which involved *workshops* or *short-term courses* mainly informative in nature providing teachers with *new information about* particular aspects of their work, while disconnected from their everyday practice. In parallel, there gradually started to emerge a new paradigm of professional development, which related it to the concept of *lifelong* or *continuing learning* and moved it away from the practice of long training days and simple course attendance (Fraser et al, 2007; Friedman and Phillips, 2004; Villegas-Reimers, 2003). In fact, this shift has been so dramatic to be referred to as a 'revolution' in education.

Villegas-Reimers (2003) refer to it as a new paradigm of professional development with certain distinctive and essential characteristics. This new paradigm sees professional development as an inherently long-term process, which is planned regularly and systematically. It is related to teachers' daily situated practice based on constructivism and treats them as active collaborative learners who are empowered through reflective practice. At the same time, professional development is intimately linked to school reform seen as a process of culture building, which may look very different in diverse settings. Crucial questions remain to be answered about how teachers can develop the required competences and how professional development can be more effective in improving teaching practice. Nonetheless, research on teacher professional development in teaching and teacher education over the last decade has shown that:

> *Teacher professional development is a complex process, which requires cognitive and emotional involvement of teachers individually and collectively, the capacity and willingness to examine where each one stands in terms of convictions and beliefs and the perusal and enactment of appropriate alternatives for improvement or change (Avalos, 2011, p.10).*

The complexity of the process is highlighted in Darling-Hammond, et al's (2017) recent attempt to define the features of effective professional development after an extensive research of the literature over the last three decades. They conclude that the kind of professional development that research has found to positively relate to powerful professional learning, instructional improvements and deeper student learning is a *combination* of features, namely a) content focus, b) active learning, c) supporting collaboration, d) using models of effective practice, e) provision of coaching and expert support, f) offering feedback and reflection, and g) being of sustained duration. The majority of these features agree with the core features that Desimone (2009) concludes to be critical for increasing teacher knowledge, improving their practice and student achievement based on a number of quality and diverse consenting research. These core features are a) content focus, b) active learning, c) teachers' collective participation, d) the duration of the program, and e) the extent that teacher learning is coherent with teachers' knowledge and beliefs. The overlapping critical features of the two studies are content focus, active learning, collaborative learning, and the duration of the program, which are all distinctive and essential characteristics of the new emerging paradigm of professional development.

While important progress has been made, the field still struggles to conceptualize holistically effective teacher professional development for quality education. One of the biggest problems concerning teacher education research is that it has been fragmented and disproportionately focusing on single aspects of what effective teacher professional development actually involves. Possibly, this is due to the inherent complexity of teaching and teacher education, and the very many variables involved (Desimone, 2009). In fact, Guskey (2003) adds a very insightful dimension to the contradictory results over the factors that determine teacher professional development effectiveness when he describes them mainly as 'yes, but..' statements underlying the inherent complexities of a real world enterprise such as teacher professional development which is immersed in ambiguities due to its situational and contextual nature. In fact, what these 'yes, but..' statements point at is that in real world contexts there is a whole interconnected system of factors that determine the effectiveness of a teacher professional development program. And this reality comes

in sheer contrast to another reality - policy makers and teachers themselves may long for simple unambiguous answers of a multiple and highly complex phenomenon. But as Guskey (2003) notes

> *These nuances of context are difficult to recognize and even more difficult to take into account within the confines of a single program. Thus programs that appear quite similar may produce different results for subtle and unanticipated reasons.*

Cranton (1996, p. 17) focuses the problem on the fact that for decades educators have attempted to answer the question "What technique, method or strategy can we apply which will cause the most learning?", where it is implicitly assumed that it is the strategies, the methods, the activities that cause learning. *Teachers' understandings, dispositions or personality* are so much disregarded that teachers could even be dispensable as it is often assumed in the case of online teaching (Jarvis, 2006). Freeman (2004) calls this view of teaching, the 'packaging view' of teaching, whose key assumption is that content plus method equals teaching. He, then, goes on to stress the importance of the teacher as the primary architect of instruction and a mediator between content and learners, whose perceptions and understandings are central to the way they represent the subject matter. As Jarvis (2006, p.25) notes we are only now beginning to recognize that 'teaching is a human process in which teachers themselves may be the best instruments that they have in helping learners to both learn their subject and achieve their potential'. It may indeed be surprising to observe the extent that teacher personhood went unnoticed,σ especially in an educational paradigm that emphasizes the human nature and process of teaching.

Towards that direction, Darling-Hammond (2003, p. 124 in OECD, 2016) advocates strongly for the need to professionalize teaching writing that professionalism 'seeks to invest in knowledgeable practitioners who can make sound decisions about how to shape education for the specific clients they serve.' She contrasts teacher professionalism as a reform approach to a more equitable quality education with a 'de-professionalization' approach to teaching, which views teaching as a simple craft

making no demands to any special teacher education preparation on the reason that teaching has no special knowledge base requiring moderate intellectual ability and which can be easily learned (Hargreaves, 2000; Darling-Hammond 2012; 2013). OECD (2016) defines teacher professionalism as having three concurrent main domains: a) knowledge base of a complex and wide body of advanced knowledge relating to subject matter, pedagogy and classroom management, b) autonomous decision-making based on sound professional judgement, and c) peer networks referring to peer collaboration, active participation in networks of information exchange and knowledge sharing at the school level.

Darling-Hammond's work has systematically focused on teacher professionalism and teacher education around the world, highlighting the differences that exist between nations that have a strong professional ideal for teaching and those that view teaching as a simple craft with no special knowledge base (Darling-Hammond, 2012). Nations with a de-professionalization approach to teaching make inadequate investments in teacher professionalism and succeed simply to ensure that '*the system will be inequitable with the effects falling most heavily on the least advantaged students'* (Darling-Hammond, 2012, *p.169).* On the other hand, it is nations with a strong mission for a knowledge-based teacher education that actually manage to offer more equitable opportunity to all their learners.

Korthagen (2017) stresses another inconvenient truth regarding the realities and the remaining problems of teacher education, the fact that teacher professional development will have to focus on individual teachers and support them in their idiosyncratic learning. One of the very first voices towards this direction has been Fullan and Hargreaves (1992), who identified the need for a comprehensive framework of teacher development which would take into consideration teachers' voice, assumptions and different work contexts. Korthagen (2017) goes on to present one of the most coherent and evidence-based frameworks of teacher development, which builds on the assumption that

We can no longer rely on standardized approaches to teacher learning, and no longer will 'good teaching' mean the same to everybody, as *teachers will differ in their experiences, their thinking, feeling and wanting* [emphasis added] (Korthagen, 2017, p.393).

The meta-study of Thurlings and den Brok (2017) reveals that research on teacher professional development is stagnant and repeatedly based on the same limited number of theories and concludes that *development of new theory is lacking* for the field to make any progress. In the same line, Kennedy (2014) argues that there is scant literature attempting to provide theoretical tools for understanding teacher professional development – in other words to understand the particular 'problems' the field is facing and why particular solutions might work. In fact, she relates this need for literature synthesis for building a coherent and wide-ranging body of theory with its potential to impact practice and help interrogate policy. Towards this direction, Korthagen (2017) proposes a strong reflective approach to teacher development as opposed to the one-sided rational approaches to teacher learning, which attempted to influence teachers' cognition and thinking alone. He talks of the need for 'professional development 3.0' which emphasizes the unconscious muti-dimentional nature of teacher learning and proposes in-depth reflection on deeper levels of the individual teachers thinking, feeling, wanting, acting, their core qualities and identity so as to establish fruitful and coherent connections with their teaching practice and educational theory.

4.3. Current research on teacher professional development on DI

International research shows that the struggle to become inclusive is still in progress and school reform being a major challenge (Strogilos, 2018). Scweisfurth's (2016) account of learner centered education implementation globally shows that while policy makers might want to improve the quality of education through the adoption of a learner-centered orientation to teaching, teachers fail to make the paradigm shift. Indeed, teachers find it hard to implement DI (Bondie et al., 2019; Subban, 2006).

Tomlinson's (2003) research has revealed that the great majority of teachers feel frustrated in attempting to deal with learner diversity, many choose an one-size-fits-all approach to teaching while only very few plan lessons in response to their students' interests, learning styles and cultural differences. In addition, often teachers who use differentiation do not implement it effectively due to their often misunderstandings of the technique or to their lack of relevant training (Bogen et al., 2019). 'Some researchers reported a gap between teachers knowing how and why to use DI and actually implementing DI with students' (Geisler et al., 2009 in Bondie et al., 2019, p, 349).

It is indicative that there is a great paucity of research on teachers' professional development for differentiation (Dixon, et al, 2014). Surprisingly, the current literature focuses solely on the practices of teachers in classroom with respect to differentiation, which practices are often unsupported by any form of teacher professional development (Smets & Stuyven, 2020). In essence, it is naively assumed that if they get some superficial information about DI, they will be automatically ready to practice it. It is increasingly though becoming apparent that teachers' preservice and in-service training on differentiation is an important prerequisite for schools to become inclusive (Strogilos, 2018). Subban (2006) acknowledges that there is an urgent need for the development of a model that deliberately focuses on supporting teachers to respond to learner diversity. It is indicative that Dixon et al. (2014) note that teacher preparation programs for DI often provide only an introduction to the theory. Nevertheless, recent research suggests that TPD on DI is a challenging process which demands carefully designed and intensive programs for teachers to gradually change (Smets and Stuyven, 2020).

On the other hand, recent research stresses the importance of the school context for teachers to be supported in their attempts to differentiate and for schools to change into inclusive education (e.g. Strogilos, 2018; Ainscow, 2020; DeNeve & Devos, 2016; Smets & Stuyven, 2020). For example, DeNeve and Devos (2016) research amply reveals how schools that are characterized by certain cultural and structural conditions are supportive of the development of professional learning communities

within the school and aid beginning teachers' attempts to effectively differentiate their teaching. Recent programs of teachers' professional development related to DI involve a combination of teacher introduction to the theory and practices of DI in two or three day seminars which are then followed by a longer period of collaborative learning and expert support in teachers attempts to translate that theory into practice (e.g. Smets & Stuyven, 2020; Valiandes and Neophytou, 2018; Arvanitis & Vitsilaki, 2015).

Bogen et al. (2019) research on the kind of strategies used in teacher training for DI that positively accounts for teachers' comfort level in helping to plan for systemic change towards DI within the school system showed that the majority of strategies relate to teacher involvement in developing their own long-term learning element plans and daily lessons using differentiation especially when the focus is on their students' previous mastery and their learning styles. An example of a TPD program towards that direction is Arvanitis and Vitsilaki (2015) professional development project, which involved Greek teachers in the use of the LbD knowledge processes as a tool for helping them learn to develop differentiated learning elements.

In the research reviewed there is only one account of a professor, Taylor (2015) who decided to educate teachers on DI by differentiating her own teaching in relation to content, process and product following Tomlinson's framework and, thus, model DI for preservice teachers. She characteristically says

> In subsequent classes, I decided to approach my teaching in the same way I was suggesting for these teacher candidates – that is, to use a variety of instructional strategies to differentiate their lessons (p.14).

In a similar line, Valiandes and Neophytou (2018) in their teacher professional development program on DI offered teachers the opportunity to observe lessons of other teachers as well as lessons delivered by the researchers either at school or through video recordings. It is important to note that the duration of a program plays a significant role in the program results (Subban, 2006). Research reviewed also shows

that there are a number of variables that can either facilitate or hamper teachers' effective implementation of DI, which findings bear important implications for TPD on DI. What follows are the most frequently cited such variables.

a) Inherent Complexity of DI

Parsons et al's (2018) research review reveals a number of affordances for adaptive teaching referring to experiences or situations which occur in advance of instruction and facilitate teacher adaptability. The nature of adaptive teaching, that is, what kind of adaptations teachers choose to do clearly affects the quality and extent of teachers' actual adaptability. In agreement with the above research, Bondie et al. (2019) also acknowledge that a barrier to effective DI implementation relates to difficulties inherent in differentiation relating to its complexity and the current realities of school such as large class sizes, limited resource materials, lack of planning time combined with the ever-increasing number of teacher responsibilities, lack of structures to allow collaboration with colleagues.

b) Teacher Beliefs

Teacher beliefs and perceptions also play a determining role with respect to teachers' ability to differentiate effectively (Parsons et al, 2018; Smets and Stuyven, 2020). The importance of teacher beliefs for DI implementation is growingly acknowledged in recent research. Guskey (2002) argues about the need to explore the specific teacher attitudes and beliefs that are most crucial to professional growth and development. Thus, Bondie et al.'s (2019) literature review identify as a barrier to teacher practice of differentiation their personal beliefs about teaching and learning, and at the same time as facilitators teacher dispositions such as their openness in dealing with ambiguity, their willingness to reflect and grow in cultural awareness and their ability to embrace differences. In the same line, Strogilos (2018) explains teacher inability to differentiate in practice with regards to teacher inability to perceive that students do differ in how they learn. Smets and Stuyven (2020) have particularly focused their teacher professional development program for DI among others to teacher beliefs in

reference to a) teacher growth mindset, b) their ethical compass, which Coubergs et al. (2017) define as the extent to which teachers take into account student needs in their lesson planning, and c) their perceptions of student heterogeneity. These types of teacher beliefs are in accordance with the types of beliefs this study has identified as core –and the first necessary level of DI – on which teachers' ability to differentiate effectively builds on, namely a) teacher openness to diversity, and b) teacher growth mindsets.

c) Teacher Knowledge

Except teacher beliefs, teacher knowledge also emerges as a facilitator or, respectively, barrier in teachers' ability to differentiate effectively. Strogilos (2018) refers to teachers' lack of content knowledge as a factor hindering teacher ability to differentiate the core learning element content areas. Van Geel et al.'s (2019) recent research has identified two particular types of knowledge as being essential for DI implementation,

1) *knowledge about students*, such as knowing students' different levels of achievement, interests, pedagogical needs, their peer relations, how to motivate each and kind of problem-solving strategies they will understand, and
2) *subject-matter knowledge*, which is considered essential for facilitating teachers make decisions with regard to setting proper goals, connecting it to students, prior knowledge, identifying students' zones of proximal development, making appropriate use of learning elements and additional materials.

It is important to note that the first type of knowledge, knowledge about students, appears to complement teacher relevant beliefs, that is, teacher openness towards diversity, or more particularly, building on it. In the same line, Parsons and Burrowbridge (2013) have identified that teachers who effectively differentiate appear to possess extensive knowledge about how students learn and effective pedagogy, in other words knowing what is taught, how to teach it, knowing why to use a particular practice and when to use it. More recently, Parsons et al. (2018) in

their research review talk about teacher knowledge involving knowledge of pedagogy, of students and Pedagogical Content Knowledge (PCK), an amalgam of content and pedagogy, and includes a variety of ways for representing the content to make it comprehensible to students (Shulman, 1986). PCK is topic-specific knowledge which is accumulated over time and it represents a repertoire of teacher pedagogical constructions on different regularly taught topics.

d) Teacher Experience

Another teacher factor that plays a determining role in teacher ability to differentiate is the amount of teacher experience. Affholder's (2003 in Subban, 2006) unpublished EdD thesis reveals that differentiation was favored by more experienced teachers who were familiar with the curriculum they taught and who had received extensive training in DI. This finding agrees with Parsons et al.'s (2018) research review which also identifies teacher experience as facilitating teachers adaptive teaching to individual student needs explained as due to their possession of more pedagogical knowledge resulting from their experience. This requirement in combination to differentiation's complex nature results in DI being a task mastered only by few teachers and making beginning teachers feel particularly unprepared for it (van Geel et al., 2019).

e) Teacher Reflection

In accordance with what has been already discussed, teacher reflection emerges as a facilitator in teacher ability to differentiate effectively. Parsons et al. (2018) review has shown that teacher thinking, and in particular teacher reflection and metacognition, which refers to teacher deliberate contemplation of their own teaching practices, knowledge and beliefs so as to regulate their own thinking, not only facilitates adaptive teaching but it is essential to respond to student diversity. In fact, research shows that teachers who succeed in effectively differentiating their instruction are highly reflective teachers (Parsons and Burrowbridge, 2013).

f) Teacher Control

Another factor that emerges from the literature as either a barrier when not existent or a facilitator when existent is teacher control over their teaching. Parsons et al.'s (2018) review reveals that lack of teacher autonomy functions as a barrier to adaptive teaching. In parallel, Bondie et al.'s (2019) study shows that an increase in teacher decision-making empowers teachers changing their feelings of control of DI. After all, the core of differentiation is in teacher deliberate and well-considered choices based on their analysis of a variety of student needs and continuous monitoring of their progress (van Geel et al., 2019). Thus, the second level of DI this study identifies, which relates to the development of teachers' ability to design their own differentiated high-quality curriculums is empowering of teachers granting them control over their teaching and facilitating DI implementation in the classroom.

g) Teaching Context

Apart from factors related to teachers, the nature of the teaching context can also function as a barrier or a facilitator to teachers' ability to practice DI. For example, research shows that contextual factors such as supportive administrators, professional learning communities, or the use of dialogic teaching can aid teachers' DI implementation (Bondie et al., 2019; Parsons et al., 2018; De Neve and Devos, 2016). On the other hand, curricula, standards or other external pressures such as high-stakes testing limit teachers' ability to effectively DI.

h) Resources

Other contextual factors that appear to play a role in facilitating DI practice refers to the availability of appropriate resources. Resources are defined by Bondie et al. (2019) as the availability of technology, immediate and consistent feedback from administrators and colleagues as well as subject matter knowledge. On the other hand, Strogilos (2018) refers to teachers' difficulty to locate and use effectively the appropriate resources as a hindrance to the effective use of differentiation.

i) Time

Time functions also as a dimension related to teacher ability to differentiate or not. Strogilos (2018) mentions the lack of time among the determining factors in teachers' inability to adjust the curriculum for students with SEN or gifted and talented students. On the other hand, Bondie et al. (2019) refer to time facilitators for DI such as making available to teachers already existing material to use so as to save time, and time provided for teacher reflection.

j) Assessment

Use of constant student progress assessment is core to differentiation especially at the third level of DI identified in this study, which refers to actual DI implementation in the classroom. Parsons and Burrowbridge's (2013) study identifies consistent assessment of student progress in multiple ways as an important attribute of teachers who effectively differentiate. Both formative and summative assessment can be facilitating in adaptive teaching (Parsons et al, 2018). However, Smets and Stuyven's (2020) research shows that teacher use of cyclical responsivity in the form of continuous assessment is a higher-order type of DI competence. Participants found it easier to focus on instructional strategies adaptations rather than to use assessment to cater for student diversity relying on an intuitive evaluation of students' readiness level.

k) Teacher Professional Development

Research reviewed suggests that lack of teacher training in the area is an important barrier to effective DI implementation in the classroom (Bogen et al., 2019). Parsons et al.'s (2018) review research revealed that professional development either pre-service or in-service constitutes an important facilitator for developing teachers' capacity for adaptive teaching. Indeed, DI seems to be favored by more experienced teachers (Affholder, 2003 in Subban, 2006).

4.4. Teacher professional development in practice: need for transformative learning

In a parallel manner to DI theory and relevant teacher practice, no matter how much learning about teaching has developed, many problems occur with teacher education actual practice which is often not being coherent with research knowledge. This discrepancy between theory and practice characterizes the whole of education reform initiatives, which are 'only occasionally related to what we know about teaching and learning' (Darling-Hammond, 2013, p. 115). The research reviewed shows that what characterizes the majority of teacher professional development programs is inadequacy. Studies of school-based professional development programs for example have consistently found that teachers' needs for learning how to apply knowledge are usually left unaddressed while what characterizes these programs is disconnection from practice, fragmentation, and misalignment (Schlager and Fusco, 2003). In addition to fragmentation, available professional development programs to teachers are intellectually superficial not following principles of teacher learning according to research (Ball & Cohen, 1999; Putnam & Borko, 1997 in Borko, 2004). Often, decisions about both the structure and the content of professional development courses are left to the intuition or craft wisdom of the teacher educator (Calderhead & Shorrok, 1997). And it is certainly true that professional development often does not result to professional learning, no matter its intent (Darling-Hammond, 2017).

Webster-Wright (2009) focuses the problem on the *implicit* predominant 'training' model assumptions about professional learning and knowledge, which assumes that learning can be simply transmitted in discrete packages of a certain beginning and end, and which are rarely made explicit to allow critical examination and critique. As Webster-Wright (2009, p.703) writes:

> Although, with a nod to adult learning theories, professional development programs are more flexible and learner centered, more engaging and interactive, many remain as *episodic updates of information delivered in a didactic manner, separated from engagement with authentic work experiences* [emphasis added].

To be more explicit, in the literature reviewed for this study there appear two main competing conceptualisations of professional development which are underlain by opposing implicit assumptions about the nature of learning in general. The one is a 'technocratic' conceptualization while the other is a 'personal development' one (Friedman and Phillips, 2004). The 'technocratic' approach emphasizes *training* of teachers in order to become technical experts to fulfill specific work roles emphasizing their acquisition of technical knowledge and skills, which then have to transmit to learners in an emotionally neutral way. On the contrary, the 'personal development' approach focuses more on the individual teachers' personal development as flexible, self-reflective and autonomous professionals, who are empowered to take control of their own learning, personally engage and work with their learners. Friedman and Phillips' (2004) research on what UK professionals and their employers themselves think constitutes continuing professional development revealed that, indeed, the majority of teachers ascribed to the 'technocratic' approach perceiving professional development as a means of keeping up-to-date in their fields while activities that counted as professional development were formal short training courses, such as seminars and workshops, or gaining a qualification. Activities such as reflecting were not acknowledged as professional development. The authors note that continuing professional development is in a state of transition and in order to fulfill its potential and demonstrably impact on teachers' practice some broad agreement needs to be reached on the purposes and values of teacher lifelong learning 'to mitigate against demotivating factors such as confusion and perceived irrelevance' (Friedman and Phillips (2004, p. 372).

Similarly, Webster-Wright (2009) critique the way professional development is usually conceptualized arguing that in a literature review she undertook the majority of the literature (81%) reporting, discussing or reflecting on professional development reinforced the traditional notions of professional development with only a small proportion (26%) of empirical research challenging or critiquing them. She, therefore, recommends reframing 'professional development' by focusing on 'professional learning' rather than development arguing that 'development' implies a transmission

model of teaching and learning where there is an implicit conceptualization of the professional teacher as a container of knowledge emphasizing a type of 'passive development'. This perspective agrees with O'Brien and Jones' (2004, p.684) comment that 'the term professional learning is a better way to epitomize the key characteristics of reflective practice, critical evaluation and continuing learning' explaining why the term professional learning is fast catching up as the preferred generic term. However, the definition of teacher professional development surpasses semantics. Most crucial than the terms per se, that is, choosing the term professional development *or* professional learning, are the concepts and the assumptions behind. It is, thus, necessary to make explicit the assumptions behind different conceptualizations of professional development.

Towards this direction, Kennedy's (2014) framework identifies a spectrum of nine models of continuing professional development that are prominent in the literature starting from a) the training models, and moving on to b) deficit models, c) cascade model, d) award-bearing models, e) standards-based models, f) coaching / mentoring models, g) community of practice models, and ends with h) collaborative professional inquiry models. What is particularly valuable in Kennedy's framework are *the categories of purpose* he identifies, which resonate back to Webster-Wright's (2009) argument about the implicit assumptions behind different professional development conceptualizations. In other words, Kennedy's (2014) framework allocates specific models under one of three specific categories, which also move along a spectrum of *increasing capacity for professional autonomy and teacher agency*. The first category is the '*transmissive'* category, which includes the training, the deficit models, and the cascade model. The second category is the '*malleable'* category which includes the award-bearing, the standards-based, the coaching / mentoring and the community of practice models. The third category is the '*transformative'* category which includes only collaborative professional inquiry models. The importance of these categories of purpose consists in surpassing the dualism that the two ends of the spectrum identify between transmission versus transformative conceptualisations of professional development, and identifying a middle category which indicates that any of the included models can be used to different ends, transmissive or transformative, making

calls on the importance of being explicit and grow aware about assumptions behind teacher learning.

Both Kennedy (2014) and Friedman and Phillips (2004) conclude their analyses on teacher professional development by stressing the importance of and the need to relate it to the concept of professionalism. It becomes clear that it is essential for TPD research and practice to be explicit about the nature of teacher and teaching conceptualization it embraces and tries to build on since such different assumptions are inherently linked to different approaches to TPD. Kennedy (2014) using Sachs' (2001) identification of two contrasting perspectives on professionalism, the managerial and the democratic one, acknowledges the need to consider the wider systemic picture and interrogate the underlying perspectives on professionalism, which due to their implicitness may allow the adoption of professional development policies or practices that are incongruent with the underpinning professionalism perspectives. In particular, managerial professionalism, stresses management, prioritizes efficiency and compliance, and favors externally imposed accountability. On the other hand, democratic professionalism, in coherence to the 'personal development' approach to professional development, sees teachers as change agents, favors teacher agency, collaboration and openness and values commitment to social justice. In a similar line, Friedman and Phillips (2004) consider it important to relate teacher professional development to the ideals of professionalism such as those of personal autonomy, responsibility, judgment and ethical norms as a way out of its conceptual vagueness and an imperative to be distinguished from ideals of 'increasing job security', 'organisational competitiveness' or a means to 'credentialism'.

In sum, what is noteworthy is that current education struggles with *change* from what is known and familiar to what is unfamiliar and research-based both at the level of teaching practice and the level of teacher education practice. As Calderhead and Shorrok (1997) note the way we understand the work of teachers is inherently related and influences the way we think about their professional preparation. Thus, theory and research findings call for the need to differentiate along with the need for professional development embracing the complexity of the process focusing more on

individual teachers' growth, while teachers and teacher educators in practice cannot escape prior images and practices of transmissive teaching. This is actually a struggle for paradigm change calling for the need for transformative learning principles in any TPD on DI program. Transformative learning purported by Jack Mezirow is a theory of adult learning that falls under the critical theory paradigm emphasizing emancipation and development through a process of self-reflection. Mezirow (1996, p.162) describes it as an evolving theory of adult learning which is framed as a 'general, abstract and idealized model' that explains the generic structure and processes of learning useful to 'action-oriented adult educators'. Its impact has been large since its appearance. Calleja (2014, p.118) claims that 'it has changed the way we understand adult learning'.

Mezirow (1996) makes a main distinction between two different learning domains, namely Instrumental learning and Communicative learning, which are two extremely useful categories in our analysis of teacher professional development in connection to differentiation demands. **Instrumental learning** appears to connect inherently to transmissive models of education while communicative learning appears to connect to the type of transformative learning required for TPD on DI. The distinction builds on Habermas' influential work (1971), who has rather insightfully described three types of human interest that can generate knowledge. These interests are: a) technical interests, b) practical interests, and c) emancipatory interests (Cranton, 1996; Calleja, 2004). Instrumental learning is derived from people's technical interests which count as knowledge only knowledge that enables them to *control the external environment*. Instrumental learning builds around the core assumption that there is a real world out there which exists independent of mental or linguistic constructions (Mezirow, 1996). From a philosophical standpoint, this is the core assumption behind the positivist (Mertens, 2015), or else the objectivist (Mezirow, 1996) paradigm, which has pervaded the Western culture and constrained educational thought and practice based on the limiting assumption that social relationships and human learning can be explained and controlled in the same way that the natural external world can be explained and controlled (Jarvis, 2006; Cranton, 1996; Mertens, 2015). In Cranton's (1996, p. 17) words in this learning domain,

We look to explain human relationships, human learning and even our morality in terms of instrumental knowledge.

On the other hand, **communicative learning** closer to DI practices involves learning to understand the other, or else, learning to understand the meaning of what is being communicated when at least two people communicate with each other (Mezirow, 1996; 1997). Transformative learning in education is actually grounded on communicative learning processes and involves two main dimensions:

a) understanding other people, i.e the differences among individuals, how people get along with each other, the expectations and values of the learners and the community, what Habermas relates to 'practical interests', and

b) questioning and thinking critically about one's practices and assumptions resulting in their revision, what Habermas relates to emancipatory interests (Cranton, 1996). Emancipatory interests relate more to the self and refer to the human drive for self-knowledge and self-awareness stemming from an inherent desire to grow and develop (Calleja, 2014; Cranton, 1996).

Often, transformative learning is equaled to this last dimension of self-knowledge and it is defined as a deep, structural shift in basic premises of thought, feelings and actions (Calleja, 2014). In Cranton's (1996) words, it takes place when a teacher has reflected on assumptions, found them faulty and revised them. The ultimate aim of communicative learning, though, is communicative competence defined by Mezirow (1996, p. 164) as 'the ability of the learner to negotiate his or her own purposes, values, meanings rather than to simply accept those of others [emphasis added]'. For that to happen, Mezirow (1996) argues that the learners must become *aware and critically reflective of the assumptions behind their own and the others' subjective frames of reference, take reflective action* and become gradually more able to freely and fully participate in discourse.

Transformative learning builds around the frames of reference construct. Frames of reference are mental structures of assumptions, which underlie people's –and teachers'- whole range of interpretations, beliefs, values, feelings, and behaviors (Mezirow, 1997). It is through these mental structures that people make sense of their experiences. Frames of reference actually function as filters through which people perceive both themselves and the world. In his conceptualization of the construct, Mezirow has been influenced by Kuhn's (1962) philosophical conception of a paradigm (Mezirow, 1991 in Calleja, 2014, p. 120). The literature is full of synonym terms such as 'model', 'conceptual framework', 'approach', or 'worldview' (Calleja, 2014). For example, Senge (2000) uses the term mental models, which similarly to Mezirow's frames of reference, stand for the images, assumptions and stories teachers carry in their minds of themselves, of others, and the world around them, and which actually determine the interpretations they make, the way they think, feel and act. Cognitive research explains the concept as a set of interpretive 'cognitive maps' in people's minds which play the role of some useful unconscious guides that help them understand environmental information or take quick decisions in front of multiple options due to their often simplistic rendering of the external world (Leithwood et al, 2004).

Frames of reference often function in a constraining manner in people's ability to change and adapt to new practices explaining teachers' and teacher educators inability to change and practice alternative ways of teaching. Mezirow (1997) explains that frames of reference have a strong tendency to reject any idea or new information that does not fit in with their current content, perceiving those ideas as nonsense, odd, or mistaken. This automatic filtering of any new experience not only shapes but also delimits individuals' perception, feelings and actions (Mezirow, 1996). This is usually the case when frames of reference hold distortions in knowledge, such as psychological distortions, misconceptions, or ideologies that perpetuate unquestioned relations of dependence (Cranton, 1996). Senge (2000) talking about the constraining nature of people's mental models in connection to education, explains that when teachers encounter any new experience, they are unconsciously drawn to see and remember only the information that reinforces their existing mental

models. In the same line, Leithwood (2004) claims that teachers' mental models of what good teaching is are key to whether they manage to make serious changes in their practice, or end up with their usual prior practices. He continues by explaining that it is these mental models that determine how teachers interpret their students' diverse needs, or the value of any proposed educational reform.

This connects to research about beliefs showing that teachers' practice is actually determined by the beliefs they hold rather than to any innovative teaching methods or ideas they learn about, which end up to be translated through the distorted lens of prior didactic-based educational beliefs and adapted to fit the already existing teaching practices (Thompson and Zeuli, 1999 in Neville, 2006; Karavas-Doukas, 1996). Indeed, cognitive research has shown that out of any new experience or piece of information we tend to focus our attention only to those information that actually reinforce our current cognitive schemata, not paying any attention to the rest or most possibly distorting the information that is inconsistent with our current cognitive schemata (DiMaggio 1997 in Leithwood et al, 2004). Such distortions, though, are possible due to the *tacit unconscious* nature of people's frames of reference, which render the assumptions through which they filter their interpretations, their feelings, and behaviors *invisible* to them, and thus, unexamined, uncontrollable and incapable of any change, or growth.

 It is exactly those tacit frames of reference that are the focus of transformative learning. Transformative learning sets out to make those tacit unconscious assumptions explicit so as the person becomes aware and able to critically appraise their true, just, or self-deceptive nature and, if necessary, revise them (Mezirow, 1996; 1997; Calleja, 2004). Indeed, research often describes reflection and reflective practice as key mechanisms, which facilitate change in people, entities, processes and contexts (Feucht et al, 2017). Indeed, it is required a great amount of reflection for any change to take place since research on teacher beliefs shows that teachers' prior schooling experiences manifesting themselves in the form of beliefs are especially resistant to change (Thompson and Zeuli, 1999 in Neville, 2006; Johnson, 1994). In addition, great emphasis is placed in the role that culture plays together with the

influences of people's primary caregivers in the formation of those prior experiences to explain the tacit nature of frames of reference that usually hold a shared common worldview (Mezirow, 1996; 1997). Cognitive research agrees that individuals' cognitive maps are formed out of culturally shared images, common assumptions and stories (Leithwood et al, 2004).

This cultural dimension underlying the assumptions people hold play a critical role in the explanation of teacher's and the whole of education's inability to change and make the necessary paradigm shift to differentiated education. Ritchart (2015) talks about the stories of learning, referring to the beliefs, messages, values, behaviours, traditions and routines which characterize the culture of schools. He emphasizes the fact that these stories of learning are daily enacted at schools by the education world turning these stories into real lived experiences of learning and teaching for students, teachers and parents while remaining invisible to us. Thus, it is school culture that plays a pivotal role in the formation of particular stories of learning and teaching through the process of enculturation (Ritchart (2015). Enculturation is seen as a process of gradual internalization by the learners of the particular messages and values enacted by the school environment through the learners' unconscious repeated experience of interaction with the particular culture. Hargreaves (2000 citing Tyack and Tobin, 1999) talks of the *unquestioned grammar* of teaching which accurately explain how the pervasiveness of instrumental learning constrains education in the 21st century. The unquestioned grammar of teaching frames the 'rules' of education in an analogous manner that grammar frames the 'rules' of speech. What is important in this case is that '(e)ach grammar has its origins' and once established it becomes 'highly stable, slow to change' (Hargreaves, 2000, p. 153). This resonates back to the need for transformative learning for any change to take place since a school culture has been created telling a specific story of learning, and this culture enculturates each new learner to this specific story of learning (Ritchart, 2015) in a vicious circle of what time and again constitutes prior unreflective learning experiences.

The short review below of the Greek teaching context demonstrably shows that the *unquestioned grammar of teaching* (Hargreaves, 2000 citing Tyack and Tobin, 1999) underlain by instrumental learning assumptions pervades the Greek teaching context as well and stresses the need for the employment of transformative learning principles in any TPD program on DI taking place in Greece.

4.5. The story of learning told by the schools and TPD in Greece: a story of instrumental learning assumptions

In Greece, more than 80% of school decisions are adopted by the Ministry in Greece, in relation to 35% across OECD countries ranging from curricular decisions, resources or assessment policies allowing schools and teachers low levels of autonomy and decision-making with regards to their unique contextual needs (OECD, 2018). Due to this long tradition of strong central control, the system is not currently ready to promote large scale autonomy of schools since 'many principals are not equipped to be autonomous' (OCED, 2017: p. 27).

Greek education is a quite uniform and one-dimensional education offered to students with compulsory for all subjects taught in lower secondary schools except for the subject of the second foreign language, where students have three language options, French, German and Italian (Ministerial Decisions 137429/Γ2/02-09-2014 and121072/Δ2/22-6-2016). The whole educational system is greatly geared towards the Panhellenic university entrance exams, which functions as a strong extrinsic motivator for learners. The OECD (2018) review team reports that they were not made aware of any expectations for students in Greece beyond passing their grades and attending tertiary education, while both student achievement and motivation, as reported by students, are lower than the OECD average. As it has already been mentioned (see 1.1), the great majority of students start attending private foreign language schools as early as the first classes of primary school with aims of receiving the appropriate language certification. This reality leads to great inequalities in the public-school classes where students exhibit mixed EFL competency levels (Institouto Ekpaideutikis Politikis, 2012).

The Greek students are reported to give generally positive feedback on their teachers. According to the 2015 PISA survey the level that students in Greece feel teachers support their learning is higher than the OECD average. Although there are no relevant statistics available, this picture agrees with the picture that the OECD review team draws of Greek teachers many of whom are reported to be dedicated, creative teachers with higher levels of education at a master and PhD level. With respect to DI, Tzanni's (2018) research has revealed a gap between what Greek EFL teachers in particular endorsed at a theoretical level and their actual practices. Tzanni (2018) research showed that Greek EFL teachers are positively inclined towards DI and they are familiar with the term, but they tend to adopt weaker differentiation techniques while they feel that they are not adequately trained to address learners' diversity. In addition, despite the overly mixed-ability nature of EFL classes, they consider differentiating by student readiness less important, endorsing DI for student motivation enhancement. The study also highlighted the need for TPD on DI.

It is interesting to note that Greek teachers 'motivation for participation in professional development opportunities relates to the connection of theory with classroom practice for 95% of teachers, the certification of their participation for 78% and the educational leave that accompanies such programs for 70% of teachers (Karagianni, 2018). In Greece, teachers' continuing professional development does not yet constitute an organic part of the way their role and practice is perceived (Papanaoum, 2008). Within a context of high central control, the Institute of Educational Policy (IEP) is the central body responsible for planning and implementing the government policies related to teacher education (Law 3966, Government Gazette A' 118/24-05-2011). Recently, there has been some devolution of teacher education to the regional level. Regional directorates of education have acquired greater responsibility for providing scientific and pedagogic support and guidance to teachers through their school advisors by taking initiatives regarding teachers' training aligned to teacher needs and encouraging the implementation of innovations in education (OECD, 2017; OECD, 2018; Law 4823/2021). The Hellenic Open University complements the role of public universities functioning as the only distance learning

university in Greece that offers courses of continuing and lifelong learning education often at master or doctoral level.

Papanaoum (2008) argues that teacher in-service training is opportunistic, unconnected to any other measures taken relating to the teaching profession and lacking any systematic planning. Karagianni (2018) comments that Greek teacher professional development opportunities take place without any prior needs analysis, scientific research and evaluation, with draft laws and law amendments staying inactive or not consistent with the way they are finally implemented in practice. In fact, teacher education in Greece appears to be plagued by the same challenges that quality education is plagued all over the world, namely, its resistance to change and practice alternative ways of teaching despite what Papanaoum (2008) describes as emergent optimistic messages of innovative professional development programs taking place at a small scale with visible results on student learning. The majority of the professional development opportunities offered to Greek teachers are not planned in accordance to scientific research and principles of what constitutes effective adult learning (Karagianni, 2018; Papanaoum, 2008; Georgiadou, 2011). For example, teacher training offered to teachers by school advisors constitutes two-hours meetings which are informative in nature and involve simple presentations by invited guests on specialized topics (Georgiadou, 2011). As a consequence, OECD (2018) identifies the need for the Greek educational system to raise expectations and focus on improving its quality, equity, student learning and teacher professionalism.

4.6 Teacher Professional Development on Differentiated Instruction: need for a polyvocal transformative approach

This study proposes the use of a polyvocal transformative approach that employs multiple learning pathways for teachers' professional development on DI (see Fig. 4.1). It proposes that a TPD program on DI that sets aims for i) transforming teacher mindsets so as to communicate more openly with diversity, and/or ii) developing teacher ability to design high-quality differentiated learning elements should employ the following multiple transformative learning pathways:

a) use **transformative learning principles** so that teachers start reflecting on their prior experiences and practices as well as their implicit instrumental teaching assumptions (see 4.8).

b) use **differentiated instruction principles and processes** so that teachers experience the new learning paradigm, develop deep understandings of core DI concepts to transfer in their real-world classroom contexts, and feel intrinsically motivated through the satisfaction of their basic affective needs (see 4.9)

c) use **situated learning principles of a Community of Practice** so as to experience an open to diversity community culture, develop a sense of belonging to the community and learn from and with others through a different learning pathway (see 4.10)

Such a polyvocal approach to TPD aligns well with aims of teacher professionalization seeking to invest in deeply knowledgeable professionals able to take decisions autonomously and, at the same time, participate actively in networks and collaborate with peers. It also aligns with the transformative learning category of communicative learning grounded on communicative learning processes, which involves understanding of other people, questioning and thinking critically about one's own practices and assumptions (see 4.4). In parallel, it addresses most of the variables, i.e. teacher beliefs, reflection, knowledge about students, autonomous decision-making, the existence of resources, the development of professional

Teacher Professional Development on Differentiated Instruction

Processes & conditions

Transformative learning processes
- self-reflection
- critical reflection
- experience differentiation
- practice differentiation
- engage effectively in rational discourse with others
- an open to diversity teacher educator

Differentiated instruction processes
  Meaningful learning
- learning centering around a few core concepts
- learners involved in higher order thinking
- reaching deep understanding to transfer to real-world
  Responding to learner diversity
- inviting learner subjectivity & life narratives
- connecting prior to new knowledge
- provision of a variety of learning pathways (multimodal meaning representations, multiple learning styles: experiencing, reflecting, thinking, acting)
- including learner interests

Community of practice processes
- everyone having an equal opportunity to participate free from coercion
- negotiating together new knowledge
- hearing alternative perspectives
- experiencing emotional support during experimentation with the new
- sharing of resources, material and knowledge
- the teacher educator as a collaborative learner

Aims

❑ **Teachers becoming more open to diversity**

  Teachers develop
  - intercultural attitudes
  - reflective behavior
  - growth-mindset

❑ **Teachers developing the ability to design high-quality differentiated learning elements**

  - Meaningful learning
  - Responding to learner diversity

❑ **Developing teacher intrinsic motivation**
  Addressing teacher basic affective needs
  - teachers to feel competent
  - teachers to feel autonomous
  - teachers to feel a sense of belonging

Figure 4.1. This figure depicts the polyvocal transformative processes / conditions and aims that this PhD research synthesis of the reviewed literature proposes for teacher professional development on differentiated instruction

learning communities, that research (Parsons et al, 2018; Smets and Stuyven, 2020; Parsons and Burrowbridge, 2013; Strogilos, 2018; van Geel et al., 2019; Bondie et al., 2019; De Neve and Devos, 2016) has shown to play a determining role in teachers' ability to differentiate (see 4.3). To be more explicit, the polyvocal transformative approach that this study proposes,

a) setting aims of **transforming teacher mindsets** for teachers to become more open to diversity i.e. exhibit intercultural attitudes, reflective behavior and growth mindset when dealing with student diversity by attempting to develop

103

teacher self-reflection and reflective practice through its employment of transformative learning processes such as reflection, experiencing the new, engaging effectively in rational discourse with others, practicing the new within their own classrooms.

b) setting aims of **developing teachers deep understanding** of students' diverse needs and the principles for the design of high-quality differentiated learning elements by focusing teacher learning on essential knowledge involving them in higher-order thinking processes and diverse learning experiences, i.e. experiencing, reflecting, thinking, acting, multimodal meaning representations autonomously and with others

c) setting aims of **developing teacher intrinsic motivation,** i.e. addressing teacher basic affective needs for
   i. feeling competent by setting challenging tasks, cultivating a growth mindset
      community classroom and allowing teachers to experience success with DI;
   ii. feeling autonomous by offering choices, empowering teachers to take conscious control of their teaching and learners' learning through the design
   iii. of their own learning elements, teacher emancipation from implicit frames of reference and constraining views
   iv. feeling a sense of belonging by developing a community of practice (see paragraph d. below)

d) setting aims of **developing a community of practice** with an **open to diversity** culture, i.e.
   i. being open to alternative perspectives,
   ii. reflecting and hearing others free from coercion and feeling free to choose their own pathway,
   iii. everyone having an equal opportunity to participate,

<ol type="i" start="4">
negotiating together new knowledge.
experiencing emotional support during experimentation with the new,
sharing of resources, material and knowledge,
the teacher educator as a collaborative learner,

A tool that could help make more concrete the knowledge processes that a teacher educator could employ in order to effectively implement such a polyvocal transformative learning curriculum is proposed to be the Learning by Design template (see chapter 3). As section 4.11 below shows LbD is a tool that could effectively support the design of what appears to be a demanding and complex process, i.e. the design of a polyvocal transformative, curriculum with a focus on DI.

What follows is a more detailed presentation of the rationale behind the employment of each of the three different polyvocal transformative learning pathways for effective TPD on DI, namely a) transformative learning processes, b) differentiated instruction principles and processes, and c) situated learning principles of online Communities of Practice.

4.6.1. Using transformative learning processes and conditions for Teacher Professional Development on Differentiated Instruction

For transformation of teachers' undifferentiated frames of reference into more inclusive, discriminating, permeable, critically reflective and integrative of experience frames of reference, the following processes and conditions are needed according to transformative learning theory: disorienting dilemmas, critical reflection and self-reflection, engagement in effective rational discourse with others, conscious educators who assume the role of collaborative learners, and reflective practice.

Disorienting dilemma and reflection

The transformative journey begins with a disorienting dilemma, which Taylor and Elias (2012 in Calleja, 2014) define as experiences that shed light on and challenge previously tacit, unexamined and unquestioned assumptions. Such experiences could be failure in practice or changing circumstances that prove previously held beliefs problematic and irrelevant (Mezirow, 1996). Such dilemmas can only be resolved through processes of critical reflection and self-reflection where the individual starts examining and critically reflecting prior unexamined ways of thinking (Calleja, 2014). Reflection sheds light to what was previously invisible and, thus, enables teachers as learners to see, revise and change constraining beliefs and practices. That is why, often this moment of realization is described as 'enlightenment' (Cranton, 1996).

It is through the process of critical self-reflection and reflection, that transformative learning gradually leads individuals into a fundamental change, or else transformation, in the way they perceive themselves and others. Self-reflection aims to make learners aware of their knowledge distortions– the mental constructions
they take for granted and which function at a level beyond their conscious control limiting, thus, their options and ultimate control over their lives and professional practice (Cranton, 1996). The most profound type of reflection concerns learners' examining their own premises and value system in light of their practices which leads to more comprehensive and global re-evaluation of their practice (Calleja, 2014).

The basic assumption behind transformative learning is that a change in teacher mindsets can lead to changes in their classroom behavior and practices. There are models, though, that reverse the sequence in which these outcomes occur. Guskey (2002) proposes a model of teacher change where teacher experience of improvements in student learning comes first. In other words, it is proposed that it is teachers seeing evidence of successful implementation in practice with student gains in terms of their learning and / or their behavior and attitudes that lead to changes to teacher beliefs and attitudes. However, it is argued that this is a simplistic dilemma of an 'either..or' nature coming from the tradition of undifferentiated education. As Guskey (2002) admits his experientially based model of teacher change overly simplifies a highly complex process where teacher attitudes must at least change from

'cynical' to 'skeptical' for any change in practice to occur. According to research, the process of teacher change is probably cyclical rather than linear, where changes in beliefs and attitudes most likely spur changes in practice which then spur further changes in beliefs and attitudes (Huberman, 1983, 1985, 1992, 1995 in Guskey, 2002). Thus, any one-dimensional approach to teacher professional development would most probably fail to capture and address the demands of effective teacher change.

Engage effectively in rational discourse

Another process for transformative learning refers to interaction with others and highlights the importance of the social dimension for widening up one's egocentric understanding of the world and significantly contribute to the gradual development of their communicative competence. Mezirow and Associates (1990 in Calleja, 2014) give a quite clear account of the ways interaction with others is greatly supportive of transformative learning through:

- o identifying alternative perspectives
- o providing emotional support guiding the process of transformation,
- o analysing one's own interpretation of one's situation from different points of view,
- o identifying one's dilemma as a shared and negotiable experience
- o providing models for functioning within the new perspective

However, it is important to note that it is not any type of discourse that can have such transformative effects. Mezirow (1996) takes extra care to define and describe the process as effective engagement in *rational discourse*, which stands for dialogue that allows individuals to test the validity of their beliefs and interpretations through informed, objective, rational or intuitive assessment of the reasons, evidence and arguments presented by others during the dialogue so as to achieve a consensual best judgment. It is clearly acknowledged, though, that effective engagement in rational discourse needs to be learned socially through time and practice in recognizing one's own and others' assumptions, redefining problems from different perspectives and

assistance by teacher educators (Mezirow, 1997). The optimal conditions for such transformative learning to take place require the participants in the discourse to:

a. have accurate and complete information

b. be free from coercion and freely choose to revise their assumptions and practices

c. be empathetic and open to alternative perspectives

d. be able to critically reflect upon assumptions and their consequences

e. everyone to have equal opportunity to participate, reflect and hear others, challenge, question, defend, explain, assess evidence, judge arguments as objectively as possible

f. are willing to listen and search for a common ground or a synthesis of different points of view accepting an informed, objective and rational consensus

(Mezirow, 1996; 1997)

Teacher educator as a collaborative learner

The role of the teacher educator is particularly highlighted within the context of transformative learning for consciously establishing and enforcing the above mentioned optimal conditions as norms in the learning situation. The aim is to create free space for participants' reflection and discourse and significantly minimize, confrontational dialogues, the all-pervasive instrumental learning assumptions and the differential power between the teacher educator and the participant teachers (Mezirow, 1996). In essence, the teacher educator is seen as a collaborative learner who contributes their own personal experiences and alternative perspectives in the discourse so as to arrive at a best consensual judgment among peers.

Reflective practice within one's own context

An important aspect of transformative learning is that it does not separate learning from teaching practice but sees them as inherently connected for sustained teacher professional development. That involves both processes of a) critical reflection of one's own practice within its own context (Cranton, 1996), and b) reflective and critical

implementation of new ways of perceiving, thinking, feeling and acting with reference to the transformed frame of practice (Calleja, 2014). Indeed, reflection and reflective practice have often been referred to as key mechanisms for change in people, processes and contexts (Feucht et al, 2017). SchÖn (1983 in Hofer, 2017) talks about reflective practitioners as exhibiting reflexivity, that is combining self-awareness with experimenting with new assumptions and implementing them in practice. Feucht et al. (2017) more succinctly claim that actually reflection becomes reflexivity when teachers' internal dialogue, which is informed and deliberate, leads teachers to action such as change their practices, beliefs and expectations.

4.6.2. Using Differentiated Instruction Principles for Teacher Professional Development on Differentiated Instruction

Differentiated instruction's main assumptions build on the core humanistic education assumption that individual thoughts, feelings, and experiences play a key role in learning and human development. But, when the focus changes from learners to teachers as learners the field of teacher professional development has another story to tell. The literature on teacher professional learning or development mainly refers to teachers as a collective undifferentiated entity (Korthagen, 2017; Fullan & Hargreaves, 1992). Guskey (2003, p.749) argues that the need for professional development activities to be aligned with high-quality instruction principles undoubtedly stems from an '*increased awareness of similarities between the learning patterns of adults and children [emphasis added]'.* As a result of such an increased awareness of teachers learning the same way their learners learn, what this study posits and tests is that the principles on which DI builds are the same for all learners. What differentiates adult teachers from younger learners is what differentiates all learners among them, that is, their different background and cultural experiences, their different readiness levels at different knowledge areas, their different awareness levels, their different interests, their different learning preferences, their different teaching experience.

Consequently, this study proposes that teacher professional development on differentiated instruction would be more effective if it employed differentiated instruction principles to teach teachers about differentiated instruction for three main reasons (see Figure 4.2). Firstly, it has already been discussed (see 4.4., 4.5.) that teachers have been taught to a different learning paradigm that of didactic education within an educational context that is still currently pervaded by instrumental learning assumptions. It is, thus, considered essential for them to gain their own personal affective and learning experiences of the new learning paradigm of differentiated instruction on which to build more effectively their new knowledge and understandings of what is differentiation and how it can be implemented. Research shows that teachers need model examples of *how* differentiation is implemented in the classroom (Valliandes and Neophytou, 2018; Taylor, 2015) and such a first-hand experience could function tranformatively as a valuable reference point. In addition, such experiences could be the beginning of a transformative journey starting with a disorienting dilemma (Taylor & Elias, 2012 in Calleja, 2014) stemming from the new differentiated experiences and shedding light to previously held unexamined beliefs and teaching practices (see Table. 4.1). Thus, it is claimed that teacher educators should first start cultivating a differentiated education culture offering multiple pathways to learning in their teacher professional development programs, if they are to develop teachers who will be flexible and able to teach for quality inclusive learning.

**Differentiated Teacher Professional Development
on Differentiated Instruction**

Teacher Professional Development

Teachers experience differentiated instruction
- ✓ openness to diversity
- ✓ high-quality meaningful learning about differentiated instruction
- ✓ multiple learning pathways
- ✓ intrinsic motivation

Useful tools:
Learning by Design & Understanding by Design

Teacher Practice

Teachers implement differentiated instruction
- ✓ openness to diversity
- ✓ high-quality meaningful learning
- ✓ multiple learning pathways
- ✓ intrinsic motivation

Useful tools:
Learning by Design & Understanding by Design

Figure 4.2. This figure depicts this PhD research proposal of differentiated teacher professional development on differentiated instruction

What is more, DI is grounded on meaningful learning principles, which focuses learning on some core concepts connecting prior with new knowledge so that teachers reach deep understanding for new learning to transfer in their real-world contexts (see 2.8). The need for teachers to develop deep understandings in the context of transformative learning is underlain by Mezirow (1996, 1997) who identifies the condition of having accurate and complete information in a discourse as a necessary aspect of ideal conditions for effective transformative learning. Thus, when a teacher professional development program sets aims for mindset change and the development of teachers' ability to design and plan high-quality differentiated learning elements and curriculums, both transformative and meaningful learning processes are necessary. And as it has already been shown (see chapter 2), differentiated instruction is a polyvocal approach which involves learners in multiple

learning pathways such as experiencing, reflecting, acting and thinking, which can be transformative, building on high-quality meaningful learning principles.

Finally, emotions and feelings are important for teachers' effective learning, exactly like they are for their learners' learning. A recent research carried out on the basic psychological needs of teachers by Evelein, Korthagen and Brekelmans (2008 in Korthagen, 2017) has revealed statistically significant relations between the degree of fulfilment of these basic needs in teachers and the quality of their classroom behavior pointing towards the need to include those in teacher learning. As a result, it is argued that it is essential for teacher professional development programs to take special care to create the conditions for interest-based learning, or else, the satisfaction of teachers' basic affective needs of competence, autonomy and relatedness. Thus, the implementation of differentiated instruction principles in the form of the teacher educator's openness to diversity offering a high-quality differentiated curriculum could satisfy teachers' basic affective needs.

4.6.3. Using online Communities of Practice for Teacher Professional Development on Differentiated Instruction

Teacher participation in communities of practice has received a wave of interest from researchers and reform advocates as a powerful framework to achieving effective sustainable teacher professional development (Wenger and Wenger-Trayner, 2015; Patton and Parker, 2017; Schlager and Fusco, 2003). Research has shown that the employment of communities of practice for teachers' professional development is a positive framework for sustained professional participation (Henderson, 2007). Learning through participation in a community of practice is a situated learning theory approach which represented a major shift in the field's understanding of learning and knowledge in the late 1980s (Handley et al., 2006) away from the mechanistic transmission of abstract knowledge or even a simplified process of social learning through mere interaction with others. The key characteristic in communities of practice is that individual and collective learning is blended in the process of developing a shared practice resulting in the development of a shared identity around

a particular topic (Wenger et al, 2011). Communities of practice have the advantage of involving teachers holistically - their beliefs, attitudes, knowledge, feelings, practices - while developing meaningful relationships with their colleagues. At the same time, the activity of all community members aims at the advancement of their situated teaching practice addressing issues coming from their real-life contexts of their classrooms. Communities of practice can move teachers towards dispositional change, break teacher isolation and provide a safe environment for trying out and implementing unfamiliar methods (Hadar and Brody, 2012).

The concept has been introduced by anthropologists Jean Lave and Etienne Wenger while studying apprenticeship as a situated learning model (Wenger and Wenger-Trayner, 2015). Their approach saw learning as increasing participation in the practices of the community through legitimate peripheral participation, a gradual process of becoming a member in the CoP, which results in the fashioning of a person's identity (Lave, 1991). Since then the concept has evolved. Wenger has been its main advocate, who further developed and defined CoPs

> *as a learning partnership among people who find it useful to learn from and with each other about a particular domain. They use each other's experience of practice as a learning resource. And they join forces in making sense of and addressing challenges they face individually or collectively.* (*Wenger et al, 2011: 9)*

CoPs constitute a unique type of social configuration, which is distinct from other types of social groupings such as neighborhood communities or groups of friends (Wenger and Wenger-Trayner, 2015). They are, also, distinct from social networks defined as a set of connections among people which have a learning potential used as a resource for quick solution of problems, sharing knowledge and making further connections by providing access to a rich web of information sources and information exchanges (Wenger et al., 2011). In fact, what distinguishes a CoP from any other social configuration are the following three crucial characteristics:

a) Domain. Members of a CoP share a domain of interest which brings the group together (Buyington, 2011). As a consequence, membership in the community requires some knowledge and competence in this particular domain of interest (Bond and Lockee, 2014).

b) Practice. The key element of any CoP is its practice. The community members are practitioners, who develop a shared practice through their knowledge building and sharing efforts in the community. This shared practice constitutes a shared repertoire of resources such as shared experiences, stories, tools, ways of addressing problems, etc which takes time and sustained engagement with the community to develop (Wenger and Wenger-Trayner, 2015). Actually, it is this element, practice, which moves the group to action (Buyington, 2011). According to Wenger (1998), practice in a CoP is actually social practice, which implies *doing* within a historical and *social context*. Such practice includes both the explicit and the tacit, that is both what is said and represented in the community language, documents, symbols, tools and artefacts, or the community procedures and well-defined roles and criteria, and what is left unsaid and assumed in the community underlying assumptions, tacit conventions, or implicit relations.

c) Community. Increasing participation gradually forms the community. It is the community that keeps the group connected through the development of relationships and trust building (Buyington, 2011). In other words, the formation of a community requires a commitment and a sustainability which is absent from mere social networking (Wenger et al, 2011). In a community, members in pursuing their shared interest interact and develop relationships that enable them to learn together, engage in joint activities and discussions, help each other, and share information (Wenger and Wenger-Trayner, 2015). Central to the formation of a community is the concept of identity more than that of learning. In a CoP, learning is not simply about developing one's knowledge and practice (Handley et al, 2006). Learning changes who we are through the exploration of new ways of being and opening new dimensions

for the negotiation of self (Wenger, 1998). Learning within a CoP is more about becoming and in the process negotiating and transforming one's current identity.

Every CoP constitutes the proposal of an identity holding the key to real transformation (Wenger, 1998). It forms a social context with certain tacit assumptions and values and certain explicit practices. Thus, the formation of a CoP is a process that involves every member in processes of identity negotiation resulting in the embracement or rejection of the opportunities given to participate more fully in the community depending on the degree of agreement or dissonance with their current sense of self (Handley et al, 2006). Wenger (1998) distinguishes two central processes in identity formation work within a CoP, the process of a) identification, which refers to an investment of self in relations of association & differentiation in connection to the experiences and materials provided within the community, and b) negotiability, which refers to the degree of control that members have over the meanings negotiated within the community and in which they invest themselves.

In consequence, in the case of TPD on DI, a CoP would constitute a proposal for the formation of a differentiated-education professional identity involving its members in conscious and unconscious processes of negotiation of their sense of self with the values, assumptions and practices of the differentiated education frame of reference characterized by openness to diversity. As Schlager and Fusco (2003, p. 211) acutely observe incompatibilities in culture, leadership and tools between the CoP culture and the teachers own personal and their school culture history can hinder development of an effective professional development.

In such cases, participation in a CoP focused on DI involves teachers in processes of constant negotiation between their current sense of self and the community's social practice. It is important to note that according to Wenger's (1998) pattern of identification and negotiability taking place in the formation of a CoP, the teachers must first identify with the community's practice so as to negotiate the CoP's new meanings and increasingly invest themselves in the participative and reificative

experiences offered within the CoP, which will gradually transform them into full members of a differentiated-education social practice.

The value of Wenger's (1998) theory of CoPs in relation to TPD on DI lies in the identification of the ways that a learner can identify with a community's social practice through the combination of three *modes of belonging,* namely, engagement, imagination, and alignment. Identification namely stands for the development of a sense of belonging to the community, a basic affective need of every learner. It is indicative that Wenger et al. (2011) replace the term 'modes of belonging' in Wenger (1998) with the term 'modes of identification'. Each of these three modes of belonging creates relations of belonging to the community that expand the learner's identity through space and time in different ways offering opportunities to explore and experience new ways of being (Wenger, 1998). In particular, a) *engagement* refers to the provision of opportunities within the CoP for active involvement in mutual processes of negotiation of meaning, b) *imagination* refers to the provision of opportunities for exploring possible images of the world and creating new connections through time and space, and c) *alignment* refers to the provision of opportunities to coordinate learners' energy and activities so as to align with broader structures and contribute to broader enterprises.

CoPs are often seen as emergent, informal and self-producing entities that extend beyond formal organizational structures or any attempts to artificially build them as part of a professional development intervention (Schlager and Fusco, 2003). Indeed, Wenger (1998) characterizes the nature of a CoP's joint enterprise as 'indigenous', that is, produced by the participants themselves in their day-to-day reality and engagement with it. However, in a more mature phase of the concept's development, Wenger (2015) attempts to address the existing myths about CoPs that they are always self-organising, informal, with no leaders within their bounds. He argues that most of the times CoPs need some cultivation while leaders play a critical role since decisions need to be taken and conditions to be put in place. And particularly when they are used intentionally for the development of the strategic capability of an organization, they need to go through some formal process. In fact,

according to Wenger (2015), CoPs exist in a variety of forms. They can be small or large, local or cover the globe, exist within an organization or across various organizations, be formally organized and supported or completely informal and invisible, its members can meet face-to-face or online. In fact, close to the 2020s in the field of teacher professional development online teacher communities are one of the most popular forms of technology based professional development (Lantz-Anderson, et al, 2018) - more popular than face to face communities.

Online learning is increasingly becoming a preferred model for both participants and providers since emerging technology tools offer endless opportunities for teachers as learners of varied backgrounds and interests to attend professional development programs tailored to meet their different needs quite conveniently eliminating the cost, the need for travel or scheduled classes (Lantz-Anderson, et al, 2018; Holmes et al, 2010). As Macia and Garcia (2016) showed asynchronous online learning provides a flexible mode of access for teachers comfortably fitting their personal circumstances. In essence, the online approach to professional development, whether it is synchronous or asynchronous, has the advantage of focusing directly on the learner providing 'strong interactions with rich resources and prolific discussions among members of the learning community' (Holmes, et al., 2010, p.351). On the other hand, participants in online professional learning run the risk of 'never-ending' engagement since online learning gradually enters into teachers' non-work time and over-burdens them (Macia and Garcia, 2016). It is, also, important to note that the type of technology chosen for online learning seems to make a difference to the type of teacher engagement and practice it supports with social media supporting more rapid and immediate exchanges while blogs being the preferred mode for less interactive and slower forms of self-reflection (Macia and Garcia, 2016). However, as researchers note no matter how many advantages online learning may have in terms of convenience, cost effectiveness, the frequency and the extent of interaction with others, or access to a wide range of rich resources, it does not translate directly into sustainable CoPs or high-quality learning (Schlager and Fusco, 2003; Holmes et al, 2010).

Lantz-Anderson et al.'s (2018) systemic review of studies over the last twenty years gives us an invaluable picture of what happens within professional online teacher communities when teachers interact online distinguishing between formally-organised and informally developed communities. Formally-organised online teacher communities are defined as top-down professional development endeavours initiated by schools, districts or government agencies with predetermined content and goals, while informally-developed online communities are bottom-up initiatives of groups of practitioners who chose to come together to discuss, share info and work together. This distinction helps clarify the nature of a CoP developed in the context of TPD on DI as a formally-organized community.

According to Lantz-Anderson et al. (2018), one dimension of difference between formally-organised and emergent communities relates to the qualitatively different distribution of power within the two. In particular, while in both types the supportive qualities of the communities are important, it is only in informal communities that the democratic non-hierarchical relationships developed resulted in mutual levels of trust and a heightened sense of belonging among its members. In formally-organised communities the sense of emotional support described in the studies is a source of reflection for teachers that has implications for their teaching practices. In contrast, the heightened sense of belonging and trust of emergent communities rarely has implications for teachers' practice, but it is more closely related to teacher overcoming isolation and feeling safe enough and encouraged to discuss successes and failures or take risks and experiment in their classrooms. Thus, formally-organised online communities appear more often supportive of reflection on teachers' work featuring even a diversity of voices, views, opinions and suggestions, greater than that found in face-to-face community meetings. It is particularly asynchronous blogging and asynchronous online discussions that provide teachers enhanced opportunities to reflect on their practice, while the process of writing responses seem to facilitate forms of reflection and self-analysis non-existent in face-to-face meetings.

Nevertheless, both types of online teacher communities, formally and informally developed, are characterised by a lack of critical and/or meaningful interaction, which probably connects to researchers concerns' about the quality of online experiences and interactions among instructors, learners, and content (Holmes, et al, 2010). For example, teachers in formally-organised online communities appear to seldom challenge their peers in discussions or engage in higher levels of analysis and reflection, and while they appear supportive in their responses to peers' comments, they neither address the content of the course or further the discussion (Lantz-Anderson et al., 2018). Indeed, their exchanges involve superficial sharing of information in connection to the course content. In the same line, teachers in informally-developed online communities support each other mainly in the form of pragmatic advice lacking any more reflective modeling of their practice.

What these findings highlight for the use of a CoPs for in formally-organised TPD on DI programs with predetermined content and aims is that particular attention should be paid in the following two dimensions, a) the development of teachers sense of belonging to the community through designing for engagement, imagination and alignment (Wenger, 1998) that will help gradually form a sustained community that will keep the group connected and committed to their joint enterprise of learning how to DI, and b) the provision of high-quality learning experiences for interactions. This study proposes that the employment of DI principles for TPD using the LbD framework helps secure the provision of high-quality and meaningful learning experiences to a wide range of different teacher needs and profiles of different readiness levels, interests, and learning preferences.

4.6.4. Using the Learning by Design polyvocal knowledge processes for Teacher Professional Development on Differentiated Instruction

The underlying rationale of Teacher Professional Development on Differentiated Instruction is that any one-dimensional approach to teacher professional

development would fail to capture and address the demands of effective teacher change which should take into account different teacher needs, the hegemony of instrumental learning assumptions and the complexity of the process of TPD. This study's main hypothesis builds on the assumption that teachers to be able to teach for diversity effectively first and foremost need to experience this new learning paradigm of DI and learn within a culture of differentiated education through multiple learning pathways. It is also assumed that both transformative and meaningful learning aims and processes would play a determining role in teacher change from an undifferentiated to a differentiated and inclusive frame of reference. It has already been shown that both teacher beliefs and teacher knowledge play a determining role for effective DI implementation. Thus, it is inferred that transformative learning is essential for teachers' *mindset change* and meaningful learning is essential for teacher development of deep understandings of the essential DI knowledge and its transfer into everyday teaching practice. A framework that quite satisfactorily addresses all of the above conditions for TPD on DI is the Learning by Design (LbD) framework of a polyvocal pedagogy, which is a diversity-sensitive framework that employs processes of both meaningful and transformative learning, and which helps build high-quality differentiated learning experiences and interactions for teachers within the context of an online CoP. What follows is a more detailed exploration of LbD knowledge processes in the light of the necessary conditions and processes of TPD on DI.

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Within this framework, Kalantzis and Cope (2004) identify two essential conditions for effective learning to take place, belonging and transformation. The starting point for successful learning is for teachers to develop a sense of belonging to learning and the teacher community. Teachers' different needs, expectations, interests, motivations and aspirations should be carefully identified and supported, while teacher identities should be positively affirmed by the community (Kalantzis & Cope , 2012). On the other hand, the objective of successful learning is transformative action, which is based on teacher reflexivity, conscious learning decisions building on different teachers' identities and a process of meaning-making through processes of higher-order thinking. An essential dimension of the framework is that the role of the community of teachers is recognized for the development of a sense of belonging, a

necessary condition. After all, it is through communication and collaboration with others that teachers will develop their communicative competence, the capacity to share and negotiate their own experience and knowledge with the group contributing at the same time to the group knowledge.

Thus, the LbD framework helps build diversity-sensitive curriculums for differentiated TPD on DI responding to different teacher needs. Its open-ended dialogic design can manage to welcome and integrate teachers' different lifeworlds into learning through the processes of Experiencing the Known, which welcomes teachers to bring into learning their own experiences, knowledge, beliefs, interests, preferences, feelings and needs relevant to their own school contexts. and Applying Creatively, which guides them to reflectively go back into their own school-contexts and apply what they have learned. In addition, it can also satisfy teachers affective needs. To be more specific, teacher need for feeling competent can be satisfied through teacher educators' careful scaffolding of the challenging and higher-order LbD knowledge processes of conceptualizing, analyzing and applying creatively, which, in essence results in effective learning and transformed practice. Teacher need for feeling autonomous can be satisfied through Experiencing the Known and Applying Creatively, which both offer teachers the space to include in learning their own subjectivity and interests, and emancipate through critical reflection and self-reflection. Teacher need for feeling related is facilitated within the context of a CoP again through the personal subjective sharing within the community that allow the processes of Experiencing the Known and Applying. Finally, the LbD pedagogical moves blended with multimodal texts and meaning making processes such as alphabetical, oral, visual, audio, gestural, tactile, spatial and social can inherently address teachers' diverse learning profiles and preferences for meaning making. That way, LbD can help teachers with different learning preferences build on their strengths as well as contribute their strengths to the community.

In addition, the polyvocal LbD framework quite satisfactorily employs processes of both meaningful and transformative learning depending on the focus of each LbD cycle. It is purported that in a parallel fashion to Kennedy's (2014) identification of

'malleable' category, which indicates that any model of continuing professional development can be used to different ends, transmissive or transformative, it is argued that the LbD knowledge processes can be used for different purposes, meaningful and/or transformative. An LbD cycle can be employed with either a) aims of focusing on deep understanding of essential knowledge, b) aims of focusing on change of meaning perspectives, or meaning schemas in teacher mindsets, or c) integrated aims of deep understanding and mindset change in the context of the same topic. It is hypothesised that this polyvocal approach creates the conditions for teachers' transformative learning facilitating them to think globally and critically about a topic and making them better prepared to take action for bringing about critical change in their classroom culture and practice. Global and critical conceptualisation of a problem are the conditions that Freire (in Calleja, 2014) sees as necessary for individuals to develop critical awareness and take action for bringing about critical change as a result of critical thought. It sounds plausible that the diverse LbD knowledge processes create the necessary conditions for teachers to draw a number of different connections to the topic and see it more globally from different perspectives, namely, the reflective perspective of personal feelings, thoughts and experiences, the perspective of deep conceptual understanding, the perspective of active experimentation in practice, in the context of other teachers' different contributing perspectives. Thus, LbD creates the conditions for understandings to integrate and build on reflections with the aim to better prepare teachers for changes in their practices and communicative behaviour.

In particular, the LbD process of *Experiencing the Known* is an essential core process for both meaningful and transformative learning. Experiencing the Known, invites into the learning process teachers' prior learning and experiences, and for any meaningful learning to occur the learner must draw connections between prior and new knowledge, while the whole of transformative learning is about reflecting in one's prior experiences and learning. The LbD cycle at this stage focuses more on 'learner' holistic experiences rather than solely prior knowledge or understandings, and such a focus better builds for a differentiated pedagogy which is able to invite teachers' subjective real world into the learning process. As Kalantzis and Cope (2004; 2008;

2009) argue during Experiencing the Known learners are encouraged to bring into the learning situation what is already familiar to them such as prior everyday experiences, knowledge and interests. This process involves lots of reflective work in relation to the self and the other's diverse life-world experiences as a starting point in a journey of learning involvement and transformation within a community of learners. It is situated cognition grounded in teachers' subjective real world previous and current experience and interests taking into crucial consideration the affective as well as the sociocultural needs and identities of all teachers.

In the same line, the *Experiencing the New* LbD process is considered to be a core process for learning that can focus on either knowledge or mindsets. It sets the stage for meaningful learning and /or transformative learning depending on the focus of the teacher educator with learners start drawing connections to what is known to them. The process involves the learners in experiences with previously unfamiliar areas (Kalantzis and Cope, 2004; 2008). As it has been discussed (see 3.6), it takes place either through learner *immersion* in new facts and situations, or through a process of empirical work, that is discovery-learning which asks for observation of the unfamiliar, reading new texts, collection of new data within each learners' zone of proximal development (Kalantzis and Cope, 2008; Cope and Kalantzis, 2009). Like Experiencing the Known, the process of Experiencing the New, as the term 'experiencing' reveals, allows for more holistic experiences which involve teachers' feelings. Especially, in immersion experiences it is the affective aspect of the experience which is the most important. Thus, afterwards, it is essential to create opportunities for students to reflect on their experiences and make personal meaning out of them. In terms of transformative learning, this new experience could create the conditions for teachers to experience a *disorienting dilemma,* where their existing frames of reference fail their new practice and are proven inadequate to explain what they have experienced.

The processes of *Conceptualising by Naming* and *by Theory* are processes, which are clearly associated with meaningful learning and deep understanding purposes. Its utility for the learners to develop deep and comprehensive understanding of the topic / area under focus through concept and coherent theory formation has been

adequately discussed in chapter 3. They are the processes that are essential for teachers to gradually become *consciously aware* of the intra-systemic relations and structure, identify patterns in their experience and organize the concepts they have arrived into a coherent interpretative system, a theory, which can be then transferred and applied to new situations due to its level of generalization (Kalantzis and Cope, 2008; Cope & Kalantzis, 2009). Thus, it becomes obvious that while deep understanding has not been traditionally associated with transformative learning, as Kalantzis and Cope (2004) note, this process of organizing knowledge into a coherent system makes learner understanding *explicit* and *conscious* highlighting realities that could go unnoticed in an unreflective experience of the life-world. It is argued that it is those processes that can provide the teachers with the amount of accurate and complete information that Mezirow (1996; 1997) considers essential for the development of ideal conditions for transformative learning. Deep understanding could help the learner develop more holistic and integrative of experience frames of references. In addition, with a focus on transformative action as the outcome objective of LbD learning, deep understanding better prepares teachers to put into practice and confidently experiment with their transformed frames of reference.

The processes of *Analysing Functionally* and *Critically* stand for the critical framing pedagogy and help learners place the acquired knowledge into a historical, social, cultural, political, ideological frame (Cope and Kalantzis, 2000). Again, such knowledge is powerful knowledge for either meaningful learning or transformative learning purposes. As it has previously been discussed, such knowledge contextualization reveals the relationships of power in the social practice of particular systems of knowledge (Cope and Kalantzis, 2000; 2009) and helps learners *evaluate* them, *interrogate* contexts, interests and motives of writers and speakers along with the identification, interpretation and evaluation of different perspectives. In other words, it essentially builds on the teachers' intercultural competence, since the ability to 'decentre' and relativise one's values, beliefs and behaviours represents an advanced stage of psychological development according to Kohlberg et al. (1983 in Byram, 1997, p. 34). It actually represents a process of critical reflection, which is an essential transformative learning process to move oneself away from egocentric thinking. Both

processes of analyzing either through the establishment of functional relations or through interrogation concerning the interests, the motives and the ethics behind different knowledge claims (Kalantzis and Cope, 2008) create the conditions for the gradual development of teachers' critical capacity and autonomous thinking.

Finally, the processes of *Applying Appropriately* and *Creatively* represent the ultimate aim of every TPD program, that is, the teachers' growing able to transfer in their behaviour and apply in practice all meaningful and / or transformative learning they have been actively involved with. According to Cope and Kalantzis (2000), it is defined as a *reflective practice*, where learners are given the chance to apply reflectively the knowledge they have acquired and carry out new practices suiting their personal goals, interests, perspectives and values. It serves the important role of applying knowledge into practice and testing its validity within the intricacies and complexities of real world situations (Cope & Kalantzis, 2009). And the whole process is further scaffolded with applying appropriately activities first, where teachers can transfer their theoretical knowledge in a predictable pre-specified manner within a specific 'real world' setting (Kalantzis and Cope, 2004; 2008; Cope & Kalantzis, 2009), and then applying creatively, which relates to more challenging aspects of practice such as problem-solving, innovating, rearranging meanings in new ways possibly in new contexts, imagining new perspectives and possibilities beyond what is known, creatively mixing and matching the familiar into unusual and original ways (Kalantzis and Cope, 2008). Such processes greatly resemble autonomous thinking processes, where teachers are in full control of their practice, they can make wise judgments in relation to their contexts and creatively design, for example, their own differentiated curriculums. Such processes of teachers' active engagement with practice are compatible with research on teacher professional learning, which shows that teachers should be engaged directly in designing and using the taught strategies, or use authentic artifacts while involved in interactive activities and discussion (Darling-Hammond, et al., 2017; Desimone, 2009). In reality, these processes represent instances of reflective practice, where reflection, enlightenment and understandings can be transformed into practice where teachers experiment with new ways of thinking and acting in practice.

This last stage of the LbD cycle could function as the experientially based stage of teacher change in Guskey's (2002) model, and one more necessary process for teachers' mindset transformation, as according to the model, it is teachers' experience of successful implementation in practice with obvious improvement in student learning and / student behaviour and attitudes that spur changes to teachers' own beliefs and attitudes. In essence, TPD is not conceived as linear but as a gradual cyclical long-term process which requires a number of LbD cycles. Thus, each LbD cycle consciously builds on the previous LbD cycle.

4.7. Conclusion

This chapter has identified that the biggest challenge of education for both practitioner teachers and teacher educators is change due to the implicit predominant educational paradigm of traditional-didactic teaching which is underlain by instrumental learning assumptions, i.e. singular, fixed mindset and externally focused assumptions that pervade the school culture including Greek schools. The study adopts Mezirow's (1996; 1997) concept of frames of reference to refer to teachers' tacit mental models of learners and education and aligns with research that acknowledges the need for TPD on DI to focus on teacher subjectivity instead of any DI strategies and methods aligning with voices who advocate for the need to professionalize teaching and teachers (e.g. Darling-Hammond, 2003). As a result it proposes an original synthesis of polyvocal transformative teacher professional development on differentiated instruction identifying its aims, processes and conditions. It is assumed that such programs should aim initially at a) teacher mindset change from non-openness to diversity to more open to diversity mindsets through transformative learning principles in the context of an open to diversity community of practice, and b) the development of teachers' ability to design high-quality differentiated curriculums through differentiated and transformative learning principles.

In essence, it proposes the use of differentiated pedagogy for TPD on DI taking into account current research (e.g. Korthagen, 2017), which stresses the need for TPD to cater for individual teachers' learning needs, who like any other learner have different starting points, different interests and learning profiles, and their unique learner life-worlds. Furthermore, it proposes the use of differentiation for teacher professional development on DI on the assumption that teachers need to experience this new learning paradigm of DI and learn within the culture of an open to diversity, growth-mindset focused community of practice which is able to offer high-quality and differentiated learning experiences. A useful tool to translate polyvocal transformative processes into teacher professional development practice in the context of a community of practice is proposed to be Learning by Design.

The following chapter presents and describes Exploring DI Together (EDIT), a differentiated online TPD program on DI building in practice on the principles of differentiated TPD on DI as they have been elaborated in this chapter and the previous chapters. EDIT is aimed for Greek EFL secondary-school teachers and it attempts to cultivate a CoP with an open to diversity culture in a series of four LbD multimodal cycles.

Chapter 5
The Program of Exploring DI Together (EDIT)

5.1. Introduction

This chapter presents Exploring DI Together (EDIT), the polyvocal transformative TPD program on DI that was designed according to this study's propositions about what makes an effective TPD program on DI and implemented in the context of this study's evaluative case study so as to test its propositions. The purpose of the chapter is to present in a brief and clearly expressed manner a) the principles on which EDIT design was based, b) the aims and expected outcomes of each cycle in relation to the literature review of DI and TPD on DI of the previous chapters, c) the affective conditions that EDIT attempted to create for the participant teachers since it constituted a central tenet of the program's DI oriented nature, d) the EDIT CoP and how it was built and sustained throughout its three face to face meetings at the beginning, in the middle and the end of the program, and e) the structure of the programme built around four LbD cycles.

5.2. Introduction to EDIT

EDIT was grounded on the formation of an online asynchronous Greek EFL teachers' community of practice aiming at the development of a sense of belonging to the community by offering opportunities for teachers to explore and experience new ways of being a teacher within the differentiated education paradigm, i.e. a growth-mindset culture supportive of diversity for teachers to experience differentiated instruction and be taught about how to differentiate effectively themselves in a series of four polyvocal LbD cycles. The differentiated nature of EDIT acknowledged that despite the participant teachers' shared domain of interest, DI in English as a Foreign Language, its members are different and have diverse needs in terms of their readiness level, their interests, their learning preferences, their age, experience, professional background, etc. EDIT began in October 2016 and ended in November 2017. It entailed eight months of work with the exclusion of Christmas, Easter and summer holidays. The participating teachers met face to face three times (see Fig.5.1.)- at the beginning of EDIT on October 15th 2016, in the middle of EDIT on March 4th 2017 and at the end of the program on November 25th 2017- while the rest of the community activity and learning took place through the medium of the online Scholar platform (https://newlearningonline.com/cgscholar).
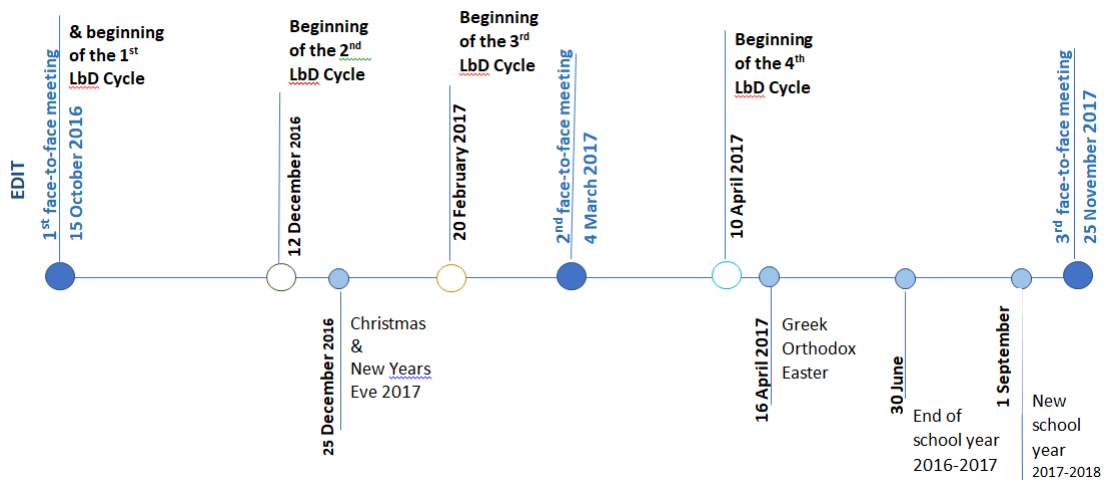
The EDIT timeline

Figure 5.1. This figure depicts the EDIT program timeline

The program adopted this study's original integrated and comprehensive model of DI constitutive of two foundational levels, a) the affective, and b) the planning level. As a result, EDIT was divided in two stages. The first stage, which involved the first two EDIT LbD cycles (see Fig.5.2), refers to the first level of DI pertaining to teacher *mindsets* and it relates to their openness to diversity. The second stage, which involves the 3rd and the 4th EDIT LbD cycles, refers to the second level of DI which relates to teacher *planning of high-quality differentiated curriculums.* Each cycle involved teachers in a series of diverse knowledge processes following situated practice, overt instruction, critical framing and transformative practice pedagogy. The knowledge processes of each cycle were related in complex ways, not in a linear hierarchical manner, and that is why the word 'cycle' is used. According to Cazden et al. (1996, p.85), '(e)lements of each [cycle] may occur simultaneously, while at different times one or the other will predominate, and all of them are repeatedly revisited at different levels.'

The Aims of the Four Learning by Design Cycles of EDIT

development of
Openness to Diversity (1)

development of
a Growth-Mindset (2)

ability to design a
High-Quality Curriculum (3)

ability to design for
Multiple Pathways to Learning (4)

Figure 5.2. This figure depicts the two core affective and the two core high-quality differentiated learning element design aims each of the four EDIT LbD cycles set for teachers' professional development on differentiated instruction

5.3. EDIT principles

EDIT translated into practice the processes and conditions that were hypothesized to be appropriate for effective TPD on DI as presented in the literature review of this study. The underlying rationale pertains to transformative learning principles since the ultimate aim of the program is teacher change. In essence, EDIT employed the LbD knowledge processes as a vehicle to implement DI principles so that teachers experience the new learning paradigm and become aware of tacit, unexamined and constraining current assumptions and practices. As a result, teachers experienced a meaningful curriculum offering a variety of learning pathways from multiple knowledge processes to multiple modalities while learning how to differentiate themselves. An essential curriculum design aim was to create the appropriate affective conditions so that teachers experience satisfaction of their basic needs for feeling competent, autonomous and a sense of belonging. To that aim the curriculum design consciously attempted to offer teachers opportunities for intellectual

challenge, choices, self-reflection, learning with others and a connection of their different lifeworlds with EDIT learning. The online asynchronous CoP constituted an inherent part of this process for the cultivation of relationships of belonging and teachers' immersion in a growth-mindset culture supportive of diversity.

5.4. EDIT affective conditions

EDIT set a series of essential affective aims. It aspired to create the conditions for the satisfaction of the participating teachers' competence, autonomy and sense of belonging needs as essential dimensions of effective DI learning. The satisfaction of those needs was a necessary precondition for important learning to take place cultivating intrinsically motivated teachers. That way, it ensured teacher engagement in the CoP and its sustainability. EDIT design aimed to satisfy teachers' need for competence through challenging tasks, its higher-order purpose of gradually developing teachers into DI professionals creating the conditions for developing deep understandings of DI through a variety of different pathways and applying it in their own classrooms. In parallel, EDIT design aimed to satisfy teachers' need for autonomy by offering teachers choices so that they take control of their learning, and providing the space and time needed for reflection. Raised teacher awareness together with better understanding of their learners and how they learn aimed to gradually enable them to take control of their teaching and make conscious decisions for effective student learning. Finally, of equal importance to EDIT design was the satisfaction of teachers' sense of belonging through the development of relationships of belonging and mutual engagement to EDIT's CoP tasks.

5.5. The online medium: Scholar

EDIT was an online learning professional development program which was set up and implemented on the Scholar platform (https://cgscholar.com) (see Fig5.3.). Scholar is based on several decades of research by Bill Cope, a Research Professor in the Department of Educational Policy, Organization and Leadership at the University of Illinois, and Mary Kalantzis, former Dean of the College of Education at the University

of Illinois. It is the product of a collaborative research and development project between Common Ground and the College of Education at the University of Illinois. The platform is particularly designed for community work employing the structure

Figure 5.3. An EDIT excerpt from the *Scholar platform*

and language of communities. The groups using its space are referred to as 'communities' while members have to 'join the community' in order to be given access to the closed community's activity. It offers the participants the opportunity to create personalized community profiles with their photos and short narrative bio-notes accompanying them so as to readily introduce themselves to the other members of the community making the whole platform activity and communication more personalized and less distant.

The Scholar platform provides a number of facilities that are supportive of community activity and development. Its users can create papers with embedded images, videos, audios, files and other media, they can publish their work for the rest of the community to read, they can collaborate with their peers, and they can connect with other communities. EDIT made use of three Scholar working spaces, a) the

Community (see Fig.5.4), which is a discussion and portfolio space combining the features of a blog or Facebook, where community members can view others' and make their own updates, which are written texts embedded with images, videos, audios, files and other media, and a community dialogue or discussion can start right below those updates, b) the *Creator* (see Fig.5.5.), which is a digital workspace resembling Google docs in its rationale where community members can create on their own or co-create with others works, which are part of projects, receive feedback from others, revise, and then, publish, c) the *Messages* facility (see Fig.5.6), which resembles the function of Google e-mails and which is used by community members to exchange private messages among them or with the administrator and teacher educator of EDIT, and d) the facility for *sharing files* and links with the administrator and/or with community.

Figure 5.4. An EDIT excerpt from the *Community* discussion space
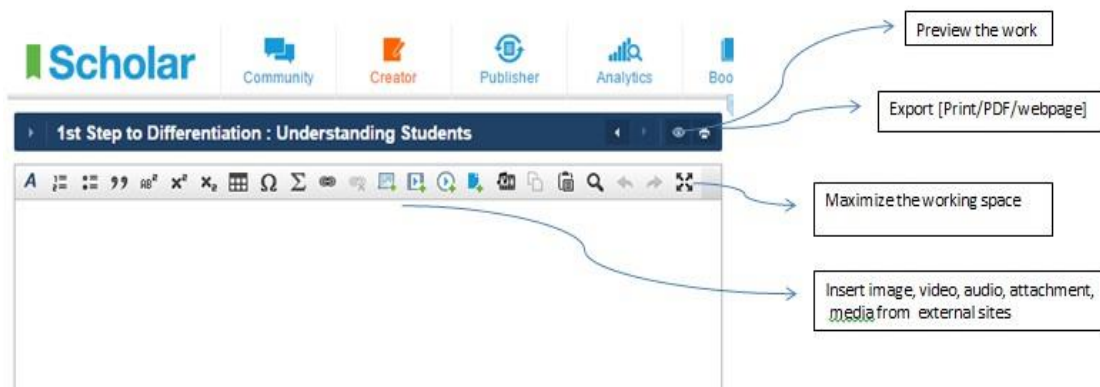
Figure 5.5. An excerpt of the *Creator* taken from the teacher Scholar guidebook created by the researcher to guide the participants throughout the platform

Figure 5.6. An excerpt of the *Messaging* facility taken from the teacher Scholar guidebook

5.6. The four EDIT Learning by Design cycles: aims, content and work examples

EDIT set two broad aims relating to teacher change and learning. Firstly, to develop teacher openness to diversity, and secondly, to develop teacher ability to design high-quality differentiated learning elements. The identification of each cycles' core concepts was grounded on the Understanding by Design (UbD) rationale (Grant Wiggins and Jay McTighe, 2005) (see 3.7. section), which purports that meaningful

curriculums should start with the identification of the 'big ideas' and the core processes of the topic framed into a set of essential questions so as to focus both teaching and learning. In the following section, there is a more detailed description of each of the final four LbD cycles of EDIT (see Fig. 5.6) aims, expected outcomes, essential questions set, core concepts identified and work examples. The researcher functioning as the teacher educator uploaded the relevant material and tasks on the platform every Tuesday. The teachers had to study, collaborate, discuss, work on the week's task and upload their own products by the following Monday. Often, due to the teachers' workload, the program had to be flexible and adapt to the participating teacher needs by extending the due deadlines.

The Essential Questions and Core Concepts of the Four EDIT cycles

What are the mistakes that prevent us from effectively understanding our students?
* stereotypes
* different perspectives
* open communication

What makes learners persist in face of difficulty or failure?
* growth vs fixed mindset
* neuroplasticity

What makes a high-quality curriculum?
* meaningful learning
* essential knowledge
* higher-order thinking

How can we teach to students different learning styles?
* the LbD knowledge processes
* MI & multimodality

Figure 5.6. This figure depicts the essential questions and the core concepts of each of the four EDIT Learning by Design cycles

The content areas identified as essential for TPD on DI following this study's literature review were the following:

i. understanding and interacting with diversity,

ii. growth and fixed mindsets,

iii. learner diversity by readiness and meaningful learning,

iv. learner diversity by interest and common basic needs,

135

  v. learner diversity by multiple Intelligences and multiliteracies,

  vi. learner diversity by learning styles and experiential learning, and

  vii. Learning by Design, bringing it all together in lesson planning

As a result, the initial EDIT curriculum involved seven LbD cycles each focusing on one of the above content areas. However, during the course of the program, which was planned to last for seven months, amendments had to be made and the seven LbD cycles condensed into four cycles due to the time each LbD cycle demanded for its completion in relation to the participating teachers' workload and time constraints.

5.6.1. The 1st LbD cycle: developing teachers' openness to diversity

The first LbD cycle ran from October 25th, 2016 to December 6th, 2016. The essential question that focused learning of the 1st LbD cycle was 'What are the mistakes that prevent us from effectively understanding our students?'. This cycle aimed at raising teacher awareness and understanding of their unconscious patterns of communication with diversity, i.e. their possible egocentric and stereotypical thinking, with the ultimate aim to be able to engage reflectively with learner diversity by the end of the program. Epley's (2014) framework (see 2.8.1.) of people's communicative attitudes and behaviours when they perceive diversity was used for the identification of the cycle's relevant 'big ideas'. In particular, the key concepts of perspective, stereotypes, and perspective getting were chosen to focus and raise teacher awareness and understanding of student diversity. At its final stage, the 1st LbD cycle expected from teachers to design and implement in their actual classrooms a learning element with the aim to develop students' own openness to diversity. This final activity aimed at connecting – and deepening - their relevant learning by applying and experiencing new learning while start experimenting with a core DI aim, that of cultivating within any classroom an open to diversity climate and attitude for all within the safe environment of EDIT CoP.

5.6.2. The 2nd LbD cycle: developing teachers' growth-mindset

The second LbD cycle ran from December 13th, 2016 to February 14th, 2017. The essential question that focused learning of the 2nd LbD cycle was 'What makes learners persist in face of difficulty or failure?'. This cycle aimed at raising teacher awareness and understanding of their possible unconscious fixed mindset beliefs and attitudes relating to a) their own fixed or growth-mindset motivational behavior when faced with challenges such as the challenges of DI and failure, b) their students fixed or growth-mindset motivational behavior when faced with challenges and failure, and c) their students' potential to grow when persisting with learning viewing challenges and failures as an invaluable part of the learning process, not easily putting the blame on what they possibly perceive as students' fixed traits. At the final stage of the 2nd LbD cycle teachers were expected to design and implement in their actual classrooms a learning element about students' own fixed or growth mindsets. The aim of this applying activity was to deepen teachers' understanding of the concepts of fixed and growth mindset through application as well as start experimenting with a core DI aim, that of cultivating within any differentiated classroom a growth mindset culture and attitude of all within the safe environment of EDIT CoP.

The concepts of a growth and a fixed mindset constituted the two core 'big ideas' of the cycle complemented with a set of other related concepts such as that of intelligence, resilience, shame and vulnerability. Dweck's (1999; 2012) research has amply shown that learners who ascribe to a fixed-mindset easily lose motivation in face of difficulties and quit trying to succeed in fear of failure, shame and vulnerability due to risk of appearing not smart enough to others. Instrumental content of the cycle referred to the nature of intelligence, i.e., how the human brain learns at a more basic level concerning the human nervous system, whose basic constituent units are neurons, which communicate with each other through the accumulation and transmission of electrical activity (Anderson, 1995), and how this whole network of connections between these units changes with experience and results in the brain's capacity to learn (Berk, 2003).

5.6.3. The 3rd LbD cycle: developing teachers' ability to design a high-quality curriculum

The third LbD cycle ran from February 21st, 2017, to April 4th, 2017. It set two essential questions, 'What is DI?' and 'What makes a high-quality curriculum?'. This cycle aimed at raising teacher awareness of their constraining current teaching practices and developing their deep understanding of the principles of designing high-quality differentiated learning elements, which would transfer in practice. Its focus was the development of deep understandings about what makes a high-quality learning element, i.e. higher-order thinking and essential knowledge. This cycle functions as an essential steppingstone in scaffolding teacher understanding of both DI and the use of the LbD template, a tool for designing differentiated learning elements, presented in the following, 4th, LbD cycle. At the final stage of the 3rd cycle teachers were expected to work in pairs, choose a schoolbook unit they would like to work on, decide on its essential knowledge and the cognitive processes they would employ to involve their students in higher-order thinking. At the end, teachers were asked to compare and contrast their pair learning elements with the learning elements they had submitted at the beginning of the 3rd cycle and evaluate them in terms of their meaningfulness. The aim of the activity was to further develop teachers' understanding of the meaningful learning principles while reflecting on their own practice for teacher change to happen.

With respect to the cycle's content, Bloom's taxonomy was chosen as a concrete example of a set of higher order learning processes. The rationale was that Bloom's taxonomy is a long-standing model of higher order learning and the majority of teachers are to some extent familiarized with its concepts and rationale. For that reason, it would make a good scaffold for later teacher understanding of the LbD template facilitating teachers connect new knowledge and understanding to prior knowledge. Core concepts of the third LbD cycle have been DI, meaningful learning, high quality curriculum, higher order thinking, and essential knowledge. It is important to note that, important knowledge and understandings about the nature of DI that was initially planned to be the focus of separate LbD cycles were included in the third cycle in a more condensed and explicit form making a conscious attempt to facilitate the teachers to draw the connections between the various aspects of DI into a coherent system of knowledge that would make it easier to transfer in practice.

5.6.4. The 4th LbD cycle: developing teachers' ability to design for multiple learning pathways

The fourth LbD cycle ran from April 11th, 2017 to May 24th, 2017. The essential question that focused learning of the 4th LbD cycle was, 'How can we teach to students' different learning profiles?'. This cycle aimed at developing teachers' deep understanding of designing differentiated curriculums using the LbD knowledge processes and multiple modalities. The ultimate aim of the cycle was for teachers to transfer their understandings in practice through the design of high-quality differentiated learning elements. This cycle ended by asking from teachers to re-design individually or in pairs again their final 3rd cycle learning element by using now the LbD knowledge processes and employing multiple modalities so as to offer multiple learning pathways. At this stage, the aim of the activity was to further develop teachers' understanding of the 4th LbD essential knowledge while reflecting on their previous practices so as to raise their awareness and create the conditions for change.

The 4th cycle actually built on the third cycle. Throughout the cycle the teachers were facilitated to deeply understand the meaning of the eight LbD processes by comparing and contrasting them with the knowledge processes of the more familiar processes of Bloom's taxonomy and Kolb's experiential learning cycle processes, which are considered to more closely relate to learners' diverse learning styles (see 2.6 & 2.8.3). The LbD learning processes were complemented with the range of different modalities that teachers can use to represent meanings and support their learners' diverse multiple intelligences profiles. Core concepts of the cycle were the concepts of learning styles, multiple intelligences, and the LbD learning processes

It is important to note that all the four EDIT cycles' work culminated in the final and only Applying Creatively activity of EDIT, which involved teachers in an applying creatively experience which asked from teachers to design from scratch a coherent differentiated learning element on a topic of their choice to implement at one of their classes with their students. At this stage teachers were challenged enough so as to

problem-solve and combine in new and innovative ways all the different dimensions of DI that they have been taught throughout the four LbD cycles of EDIT. What distinguishes this final lesson designing and implementing activity from the rest of EDIT's such activities is that it asked from teachers to problem-solve, innovate, rearrange meanings in new ways in new contexts, imagine new perspectives and possibilities beyond what was known, and creatively mix and match the familiar into unusual and original ways (Kalantzis and Cope, 2008). Teachers were expected to produce high-quality learning elements combining all aspects of DI they had been learned about throughout EDIT on topics of their choice and implement them in their classes with their students experiencing the effects that such lessons can have on student learning and affect.

5.6.5. EDIT work: some examples of EDIT activities across the four LbD cycles

All cycles began with an Experiencing the Known task encouraging them to bring into the learning situation their own subjective real prior everyday teaching experiences with respect to the content focus of each cycle. For example, the 1st LbD cycle began by inviting teachers to reflect on their experiences and knowledge with their own students so far and give a detailed description of a student they identified as a very different student. Teachers were also asked to reflect and write about their own relationship with those students, and then, to compare those different students with their peers. That way they were facilitated to initiate a transformative journey of reflection and negotiation in relation to the self and others' by becoming aware of their own perceptions and behavior towards what they perceived as difference.

Throughout all cycles after teachers had experienced the known, they were asked to Experience the New, involving them usually to multimodal experiences such a YouTube video watching, looking at pictures or reading some material. At this stage, teachers were usually asked to do nothing more than watch the video, look at the pictures, read the material and just reflect on their own feelings and thoughts while experiencing the new. In other words, the aim of the process was to keep the activity experiential and affective not involving teachers in any demanding intellectual work.

Such experiences were expected to shed a different light to their prior Experiencing the Known thoughts and practices revealing gaps and incongruent attitudes and practices with respect to the new knowledge.

For example, in the 1st LbD cycle, what followed teachers' descriptions and reflections of a different student of theirs, was watching a YouTube TEDx talk by Chimamanda Ngozi Adichie, a Nigerian novelist, on the topic of the dangers of single stories. The talk, which was an inspirational and quite affective one, introduced teachers to the essential knowledge of the cycle, the fact that seeing people, places or situations from a single perspective, creates stereotypes missing the whole truth about those people, places, situations. At this stage, teachers were expected to experience a disorienting dilemma with their existing frames of reference possibly proving inadequate to explain their known experiences of student diversity. In parallel, the tasks' multimodal format while watching a truly powerful talk immersed teachers in an emotional experience invocative of a wide range of feelings.

Next, each LbD cycle was followed with Conceptualising by Naming and Theory, and Analysing Functionally and Critically learning experiences, which involved teachers in a series of higher-order thinking. The aim of these tasks were to develop teachers' deep understandings of each cycles' core concepts, draw connections among them into coherent theoretical wholes, draw connections to their real life practices and experiences, and, finally, evaluate critically this new knowledge. For example, in the 2nd LbD cycle after teachers explored and reflected on their own mindsets through a questionnaire (experiencing the known) and watched a TedX Talk by Brene Brown on vulnerability and shame (experiencing the new), they were given excerpts from Carol Dweck's (2006) book explaining how different mindsets affect people's thoughts, actions and resilience. To facilitate conceptualization of the cycles' core concepts, teachers were asked to discuss how they would describe in their own words the two mindsets naming each with a single word.

To help teachers conceptualize by theory and construct a more coherent theory of the two mindsets, they were asked to reflect on how the mindsets affect people's

thoughts and actions, and if they could see any relation to the shame and vulnerability talks they watched during the previous stage of Experiencing the New. To analyse the core concepts functionally, the teachers were given a differentiated questionnaire in both English and Greek for students at different levels of language proficiency so as to distribute to one of their own classes, collect their students' answers, try to determine what their students' mindsets were and share the results with the EDIT CoP. To analyse it critically and look at the theory of mindsets from a distance, the teachers were asked to think and share their answers to the question 'how does the theory of the mindsets relate to teacher practice?'.

Towards the end of each cycle, teachers were mainly involved in Applying Appropriately experiences, which culminated at the final stage of the fourth LbD cycle in the end of the program into an Applying Creatively experience. This part of each cycle involved teachers in practice-focused learning experiences. At the end of each LbD cycle, teachers were given the chance to apply reflectively the knowledge they acquired during the course of the cycle and transfer it testing its validity within the intricacies and complexities of real classroom situations. As it has already been discussed, what this applying appropriately involved was teachers designing and implementing a learning element in relation to the particular aspect of DI that they were taught during each cycle.

Throughout the four EDIT cycles, teachers were involved in individual, pair and collaborative work, while they were often invited to share their answers with the rest of the community. An example of a collaborative task concerns the 3rd LbD cycle, where teachers were asked to work in pairs on an agreed unit of their schoolbook. The teachers were asked to identify the unit's essential knowledge, turn it into an essential question, then, identify the intended outcome of the lesson, i.e. what they expected their students to do with that knowledge, and upload it in the community page. The teachers were, then, divided into two groups so as to give each other feedback on the uploaded learning elements.   In relation to this social aspect of EDIT, it is important to note that special care was taken in purely self-reflective tasks not to ask teachers

to share their reflections so as for them to feel safe enough to express their most vulnerable thoughts and feelings.

Finally, the EDIT LbD cycles were wholly multimodal cycles involving teachers in diverse meaning making modalities apart from the verbal-linguistic such as the visual-spatial (i.e. watching videos, looking at pictures), the logical – mathematical, the bodily-kinesthetic (i.e. designing their learning elements), the interpersonal (i.e. self-reflecting), the intrapersonal (i.e. implementing their learning elements with their students or negotiating with colleagues within the community). Indeed, the online nature of the program was particularly supportive of the employment of multimodality since the Scholar platform allowed both the teacher educator and the participant teachers to upload videos of TedX Talks, short movies, music clips, pictures and paintings, the links of various websites, directly interact with others etc. An example of a multimodal task tapping teachers' diverse MI is the tic-tac-toe task 'Present your multiple intelligence, learning style and interests profile' of the 4th LbD cycle where teachers were asked to choose three different modes among a) the verbal-linguistic, b) the logical – mathematical, c) the visual-spatial, d) the musical, e) the bodily-kinesthetic, f) the interpersonal, g) the intrapersonal, or h) the naturalist mode and make a presentation of their unique multiple intelligences, learning style preferences and a selection of some of their core interests.

5.7. The EDIT community of practice

Following Wenger et al.'s (2011) framework, one of the program's main concerns was to offer to teachers opportunities for mutual engagement. Along that line, the Scholar platform was chosen offering the CoP a virtual space with communication facilities that would facilitate teachers to interact around joint tasks and enable them to work together asking for each other's contribution. In particular, EDIT offered teachers various opportunities to engage with each other in the form of group and community dialogues exploring answers to open-ended questions, co-creation of papers, or co-designing of learning elements with others, sharing their thoughts, feelings, experiences, classroom experimentations, their differentiated learning element

designs, student feedback, giving and taking feedback from community colleagues on their various learning elements, socializing and exchanging New Year's Eve wishes in the form of a game. Supportive of teachers' mutual engagement in the CoP activity has been the challenging nature of the tasks offered to teachers requiring their competence and knowledgeability, the sense of community continuity that the platform provided functioning as a repository of EDIT knowledge documentation and teacher communication and engagement.

Teacher participation in the community was designed to be voluntary, an essential condition for addressing teachers' need for autonomy but also for securing their initial interest. An invitation (see Appendix 1) describing the program context, aim, rationale, type of tasks and duration was sent to some Greek public school EFL teachers in Athens on September 8th, 2016, for them to choose to participate or not according to their interest (see 6.4. for more information). The fact that the program addressed solely EFL teachers constituted a conscious design decision which addressed the need for content specificity in the differentiated TPD program on DI as well as the need for members of a CoP to share a domain of interest.

5.7.1. The first face-to-face EDIT meeting

The teachers' initiation to the CoP took place at a face-to-face meeting at Kostis Palamas building, University of Athens, when the online program of EDIT officially began in the autumn of 2016 on October 15th, 2016. This first meeting was important for the online community's trajectory setting the pace of EDIT CoP's culture and introducing the members to each other since they were teachers from different Athenian secondary schools. The first meeting was designed so that the teacher educator and researcher would introduce herself to the teachers in a way that would communicate her vision of an inclusive education and how it had motivated and informed her own educational, professional and research history throughout the years. Such an introduction was deemed essential for letting the teachers know her both as a person and a professional with certain qualities and, thus, establish a more open communication with the community. Only one teacher, J2, was not present in

the first meeting, which may have played a role in her later development of a sense of belonging to the EDIT community. The teacher missed the first face-to-face meeting due to her delayed response to the program invitation.

The teachers were sitting in a circle, and they were then introduced to EDIT starting with the role of the community in this teacher professional development program. Such an introduction was also deemed essential since CoPs as a teacher professional development model or teacher colleague configuration in general is new to the Greek context. In this introduction it was attempted to state explicitly the purpose of the community, the teacher educator's role, the community members' role, the role that relationships and communication would play in such a process raising the members' awareness of the role of feelings - their own and others- and the value of feeling safe within the community to be able to take risks while leaving behind old familiar practices and habits. After setting the community framework, the aim was to create the conditions so that teachers would get to know each other better and feel comfortable with each other. They were first invited to introduce themselves to the community circle and then taking turn to answer some prompting questions that the teacher educator asked such as 'Which two traits of yours as a teacher, do you consider essential?'. After the ice was broken, there followed a jubilant coffee break where teachers were left to interact more freely. After the coffee break, the participants were introduced to DI and its main purpose, the research and its motivation, EDIT explaining its rationale and its structure with the planned LbD cycles, and, finally, the Scholar platform.

5.7.2. The second face-to-face EDIT meeting

The second face-to-face meeting took place in the middle of EDIT at Kostis Palamas building, University of Athens, on March 4th, 2017. The second meeting right after the end of the 2nd LbD cycle and a week after the 3rd cycle had begun was considered necessary for the sustainability of the community after four months of solely online and distant interaction and communication of the community members. This meeting, which lasted for three hours, was designed so as to give the teachers the

chance to openly communicate about their EDIT experience up until then, ask questions, express any thoughts and feelings they wished, and ultimately, connect with each other. By that time, too much and important work had taken place within the community and everyone felt the need to meet face-to-face so as to see each other's faces, listen to each other's voices, see each other's facial expressions, and feel close as a community in a more humanely manner. At the same time, after too much and demanding work going non-stop from the 1st to the 2nd cycle, as a teacher educator I felt that the community needed some time to sit and relax and, just catch up, and communally reflect on what had happened up until then talking in a more free and direct manner about whatever worked, did not work in the first part of the program, express positive and negative feelings such as tiredness, anger at points, ask questions and resolve issues.

Teachers started gathering a quarter before the meeting hour, and the room was filled with lots of smiles and warm greetings and laughter. Coffee was ordered and we all sat comfortably in sofas and chairs forming a circle. Two teachers could not participate in the meeting due to school obligations, i.e. A1 had to accompany some of her students to CERN, Switzerland, and B1 had to accompany her students to a Model United Nations conference in Athens. The meeting began with me reading to the community a warm greeting note from my supervisor, who due to other professional obligations could not be present followed by another warm and humorous greeting note from B1 to her *'DI family'* (see Appendix 5). I had prepared some prompts for discussion such as 'The biggest challenge for me was…', 'The community of colleagues for me was…', 'Exploring DI Together helped me…', 'I felt that I succeeded when…', 'I felt that I was in difficulty when…' etc written in Greek in slips of paper. Each teacher had to choose one and orally complete it sharing her own experience with the program. The whole discussion took place in Greek for teachers to feel closer and freer to express themselves in their native language. I had also prepared some tasks to do related to the 3rd cycle so as to prepare them for the work that was coming. Nevertheless, the need of the participants for face-to-face communication and interaction was so immense that the whole meeting was devoted solely to open community discussion starting with the prompts each teacher had chosen.

The whole discussion started with teachers' eagerness to express their enthusiasm about the previous, i.e. the 2nd cycle, content asking more questions about the concept of the growth mindset. It seemed that they were still trying to come to terms with the idea that the brain grows with learning. They admitted having learned a lot from these two cycles. For example, C1 admitted that '*many myths have been confuted* [during the program]' while D1 said that '*she feels like having earned added value through this programme*'. Soon this positive climate was dispersed by a discussion centering around all the things that pressured them during EDIT. For example, I2 complained about a core characteristic of EDIT, self-reflection, saying that the program involved them in too much reflection and she often felt like doing psychotherapy. Teachers greatest complain, though, concerned a) the asynchronous online nature of the program when they were asked to cooperate and the difficulties of coordinating, and b) their sense of belonging to the community expressing the need for more face-to-face meetings. In fact, a teacher, J2, quite strongly expressed her resentment exclaiming '*There is no community!*' feeling that the community lacked a true sense of belonging and authentic communication among teachers besides the tasks - leaving everyone a bit surprised and sceptic with the rigidity and the bitterness with which she expressed herself.

I saw that incident as a call for going deeper into relational work in the community, or else, as a natural stage in the development of the community, having invited teachers to openly and freely express their true feelings in a climate of trust. The community could sustain such challenges. I took the chance to tell teachers that '*I think that what we are actually discussing is whether we can feel like a community, that is to feel safe enough to communicate and interact with each other*' adding that an opportunity was offered to them to create the community they wished for taking any initiative they regarded necessary for a smoother community working. What followed, then, was a whole discussion about The Protocol of a Growth Mindset Classroom, a community task they had been assigned towards the end of the 2nd cycle and had not manage to complete yet. The task asked teachers to cooperate all together so as to create a protocol of practices, behaviours and/or attitudes that could help us all build a growth

mindset climate in our classrooms. The aim was to produce a table with clear and concise statements in a bullet format. For effectively doing the task in an asynchronous manner, the teachers suggested the use of Google Drive since they did not find the Scholar platform and its community facilities very helpful and flexible for working together in a common piece of text (see Appendix 6). That way, the second meeting ended with mixed feelings of all the successes and failures of EDIT that teachers had experienced up until then, with a work-focused closure for the work that was left to be done by all together as a community. And, while everyone was leaving and saying goodbyes, C1 came close to me and quietly told me '*that EDIT had saved her from a teacher burn out of the last three years'*.

5.7.3. The third face-to-face EDIT meeting

The third, and final, face-to-face meeting took place at the end of EDIT and right after the beginning of a new school year at the National Library of Greece, Stavros Niarchos Foundation Cultural Center, on November 25th, 2017. This final meeting aimed at meeting up for the last time not just to say goodbye but also to allow the participants in a relaxed manner to express their final thoughts and feelings and answer any possible remaining questions about DI and EDIT. At the end of the meeting, teachers were also given a certificate of attendance signed by my supervisor, who was also present. At this final meeting one teacher, J2, was absent.

The teacher had informed me by e-mail[3] days before the meeting that she would not be able to attend because of her son's birthday. It is possible that J2 chose not to be

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[3] Hello Maria,
How are you? I trust you are ok. I'm afraid I might not be able to come on the 25th. You see, we are going to celebrate my son's birthday along with one of his friends to share the cost. We haven't decided on the exact day, yet, but the 25th is one of the days we have in mind. I've already spoken to I2S (she's definitely coming unless sth happens) so, I would greatly appreciate it if you could give her my certificate of attendance.
Thank you in advance!
[J2]

there at the final meeting because of not having developed a strong sense of belonging to EDIT community even though she stayed to the program actively participating to its end.

That final day, we all met at the reception room of the National Library and took the elevator to the meeting room, for where we had been given a special permission. We all sat around a white meeting table, served ourselves with coffee and cookies and were happy to all meet again and see each other face-to-face. The meeting started with a greeting from me and my supervisor and went on to the participant teachers asking them each to say additionally a few words about the changes that had taken place for some of them this new school year regarding their school placements. Then, the teachers were given a handout about DI summarizing what DI is and how it can be implemented in a concise reference guide to DI drawing all EDIT knowledge together into a coherent whole. Then, an open discussion started about DI and their experience with the EDIT programme. The teachers said that they learned a lot from EDIT. For example, K2 shared with the community the impact that the program had for her saying that she began that school year by giving to her classes lessons about the growth mindset attempting to set a climate of a differentiated classroom. The teachers made special reference to the role of the teacher educator, whom they felt was very supportive, patient to respond to all their questions, flexible to adapt to their needs, and inspiring. They also referred to the demanding nature of the program due to their tight schedules and the frustrating task deadlines.

With respect to DI, the teachers felt that they did understand what is DI but that they needed more practice with it implying possibly the design and classroom implementation of more differentiated learning elements. It is only natural that most teachers felt that they needed more practice applying DI, a complex and situational pedagogy. It is important to note that by the time of the meeting only four teachers had designed and implemented their final differentiated learning elements applying creatively their EDIT learning. The discussion, then, moved on to the nature of this research, acknowledging that it is an ambitious attempt to explore DI synthesizing diverse research in new ways, while there was also a reference made to their

important contribution to this research and any future TPD programs about DI having contributed to the creation of a whole resource of differentiated EFL learning elements. The meeting ended with lots of hugs and hand-shaking hearing lots of 'thank yous' from the teachers and feeling their gratitude in the way they were looking and smiling at me. A demanding program had come to its end. The next step was to collect the final data and start the analysis so as to look at the program, teachers' experience with it, teacher change and learning about DI from a more objective perspective.

5.9. Conclusion

This chapter presented EDIT, a differentiated online TPD program on DI, that was designed and implemented as an indispensable part of this research drawing on the original synthesis of its literature review about DI (chapter 2), the use of LbD as a useful practice-focused tool for designing differentiated learning elements (chapter 3) and TPD on DI (chapter 4). What follows is the methodology chapter of the study drawing connections among the research questions that EDIT set out to answer about effective TPD on DI, the research design this study employed, the main characteristics of its sample and, finally, the methods for data collection and analysis it used.

Chapter 6
Research Methodology and Design

6.1 Introduction

This chapter presents a detailed description of the research methodology and the methods of analysis employed in relation to the research questions it sets out to answer. The chapter begins with the three research questions this thesis sets out to

answer in order to investigate whether EDIT has been an effective TPD program (see Fig. 1.1. in chapter 1) about DI facilitating teacher openness to diversity change and teachers' development of their ability to design high-quality differentiated learning elements. Then, it discusses the rationale for the adoption of the research design of an evaluative case study in the context of insider research. It also discusses the methods it employs for data collection presenting in detail the research instruments it uses, i.e. the three questionnaires that were developed in the context of this research and the learning elements that teachers designed before and after EDIT. Finally, the chapter finishes with a discussion and justification of the methods of analysis the study uses, i.e. descriptive statistics and content analysis, for its qualitative and quantitative data.

6.2. The research questions

The research questions guiding the study attempt to shed light to different dimensions of EDIT effectiveness following a program logic. The study's research questions are the following:

1. How did teachers perceive the experience of EDIT, an online differentiated TPD program on DI?

2. How effective has EDIT been in transforming teachers' mindsets?

3. What effect has EDIT had on teachers' ability to design high-quality differentiated learning elements?

The first research question seeks to explore what the teachers have to say about their experience with EDIT and how they experienced it drawing a more holistic picture of EDIT effectiveness in creating, or not, the necessary *affective, meaningful* and *transformative conditions* for teacher change and learning. In reality, the question guides the research into better understanding the nature of EDIT from teachers'

different points of view, discovering any blind spots and/or possible new aspects to consider.

The second research question seeks to explore EDIT effectiveness in being transformative for teachers' mindsets by measuring *teacher mindset change* from the beginning of EDIT to its end exploring EDIT success, or not, in positively contributing to the development of the participant teachers' more fully developed differentiated educational frames of reference. Such mindset transformation is considered an essential prerequisite for any teacher to be able to effectively design and implement differentiated learning elements that will be inclusive and equitable to all of their learners.

The third research question explores EDIT effectiveness in having an effect on teacher practice, and particularly, *teachers' ability to design high-quality differentiated learning elements* using the LbD template as a useful tool for such differentiated designs. In fact, teachers' ability to design high-quality differentiated learning elements is considered evidence of teacher deep understanding of DI and transfer in practice.

6.3. The research design: an evaluative case study

The study follows an evaluative case study research design centering around EDIT. It resembles a lot program evaluation, but, in reality, it constitutes research looking to generate
new knowledge and understandings of what makes effective TPD on DI that can be transferred to other settings. As Mertens (2015) notes research and program evaluation are two parallel genres of inquiry that have grown side by side in the educational and psychological world, and at times intersect since both make use of the same systematic inquiry methods to collect, analyze, and interpret data. What distinguishes the two is that research aims at gaining new generalizable knowledge that can be transferred to other settings, while evaluation is associated to gaining valuable information restricted to a specific setting for future decision-making.

The use of the case study was considered to be the most appropriate research design for this study because of its ultimate aim which is to investigate intensely the participant teachers' professional development and learning about DI within the context of EDIT and seeking to understand what makes effective TPD on DI. In essence, due to EDIT's unique and highly innovative nature, it is necessary to document its effects on teachers systematically and consider whether these resulted from the program. According to Balbach (1999, p.4),

> 'if a program is highly innovative, then it may be extremely difficult to predict the program's positive and negative impacts. However, it is still necessary to document those impacts systematically, and to consider whether those impacts resulted from the program. In addition the rich detail of a case study provides good information about the design of a program and the context in which it is delivered, thus allowing others to determine its appropriateness for their areas. '

The aim of this case study is an investigation and understanding of the process and outcome of the program within its real-life context, and not any kind of statistical generalization. Yin's (1994) definition makes it clear that one of the distinctive characteristics of case study research is that it allows investigating phenomena holistically within their real-life context. So much so for EDIT, which constitutes a community of practice and follows a situated learning perspective which perceives learning and context as inherently bound (Lave, 1991). Thus, it was the need for a 'comprehensive research strategy' (Yin, 2002, p.1 in Yazan, 2015, p. 138) that dictated the use of a case study inquiry. Probably, this is the reason why both Yin (2002) and Stake (1995) consider case study instrumental for the study of programs allowing the researchers to consider the interrelationships between the phenomenon and its contexts (Yazan, 2015).

De Vaus (2001) claims that the case study begins with a theory regarding a particular phenomenon, on the basis of which it is predicted that a case with a particular set of

characteristics will have particular outcomes. The point of the case study is to see if the theory actually works in a real-life situation. If it works, then the theory is supported, not proven. If it does not work, then it seeks to understand, from a careful analysis of the case, why the predicted outcome did not occur. EDIT case study begins with the theoretical propositions of the study which assume that effective teacher professional development on DI relates to a program that meets the processes and conditions of differentiated and transformative learning within the context of CoP with a differentiation culture. If these conditions are met, then the following teacher change is expected, a) teacher mindset change from non-openness to diversity towards greater openness to diversity, and b) teacher ability to design high-quality differentiated lesson plans developed.

The analysis follows a program logic attempting to describe a complex chain of events (pattern) over time (time series) (Yin, 1996) with an emphasis on tracing changes on teachers' professional development and learning while exploring the nature of the context within which such changes occurred, and attempting to draw plausible links In essence, the study follows a multiple embedded case studies design referring to the eleven participant teachers' professional development and learning. In particular, the study explores multiple bounded cases, the teachers, over time through detailed in-depth data collection involving multiple sources of information. In Creswell's (2007, p.74) words, a 'case study is a good approach when the inquiry has clearly identifiable cases with boundaries and seeks to provide an in depth understanding of the cases or a comparison of several cases'.

The EDIT case study includes both qualitative and quantitative features in the design, data collection and analysis stages of the research, while the two types of data are collected and analysed concurrently in an equivalent status design where both types of data are of equivalent status (Tashakkori & Teddlie, 1998; Mertens, 2015). The central argument for the use of both approaches in a single study is that such a design provides a better understanding of research problems than either approach alone (Creswell & Clark, 2006). According to Tashakkori and Teddlie (1998), employing both qualitative and quantitative methods build on the inadequacies of mono-method

designs providing strengths that offset the weaknesses of either quantitative or qualitative research alone. Creswell & Clark (2006) argue that quantitative data alone including closed-ended information that take the form of statistics and numbers are weak in making the participants' voices heard or in shedding light into their context. On the other hand, qualitative data alone consisting of open-ended information in the form of words, while able to present the diversity of ideas, are weak due to personal interpretations made by the researcher and the ensuing bias created by this. As a result, mixed methods studies can provide more comprehensive evidence since they 'can situate numbers in the contexts and words of participants, and they can frame the words of participants with numbers, trends, and statistical results' (Creswell & Clark, 2006, p.13).

The quantitative and qualitative data of the study are collected independently at the same time, while the final study inferences will be based on both types of data analysis results (Mertens, 2015). What is more, combining qualitative and quantitative data serves purposes of *triangulation*. Triangulation refers to the combination of data sources to study the same topic through a convergence of quantitative and qualitative results and functions as a way to assure the validity of research results succinctly describing the intellectual strength of mixed methods (Tashakkori & Teddlie, 1998).

The quality of the research design is ensured by four logical tests identified by Yin (1996) as essential for robust and strong case studies, namely construct validity, internal validity, external validity and reliability. Kidder and Judd (1986 in Yin, 1996) define i) *construct validity* as the establishment of correct operational measures for the concepts under study, ii) *internal validity* as the establishment of a causal relationship between variables, iii) *external validity* as the establishment of the domain in relation to which the findings can be generalized, and iv) *reliability* as the establishment that the operations of a study can be repeated with the same results.

As a result, the study's

a) construct validity is ensured by having pre-selected specific non-openness and openness to diversity measures in order to indicate teacher change, using at the same time multiple sources of evidence

b) internal validity is ensured by employing the analytic tactic of program logic establishing a causal relationship between the conditions and processes of EDIT and teacher openness to diversity before and after EDIT

c) external validity is ensured by having already developed theoretical propositions for teacher professional development on DI. The program is based on some theory explaining why the intervention should have the observed effects. In other words, the results of the study are analytically generalized in relation to the theory, which will be further tested through *replications* of the findings across the multiple participant teachers' cases of the study.

d) reliability is ensured by thorough documentation of the procedures and the context. In the case of insider research, reliability is further enhanced by the insider researcher fully acknowledging and describing their own position within the context of the study (Fleming, 2018).

6.4 An insider research

This research is an insider research since the designer and teacher educator of EDIT, an active practitioner, operates at the same time as the researcher. Even though, the literature on the methodology of insider research is limited (Chavez, 2008; Mercer, 2007), insider research is common in the field of education, where an increasing number of teachers, who attend masters and doctoral programs, engage in examining their own practice within their own schools or colleges (Fleming, 2018; Floyd & Arthur, 2012; Mercer, 2007; Hellawell, 2006). Insider research is defined as research where the researchers are complete members of organizational systems and communities researching their own communities (Brannick & Coghlan, 2007). Insider researchers

share the same setting and are emotionally connected to the research participants (Floyd & Arthur, 2012).

Insider research is often contrasted with outsider research (Fleming, 2018; Chavez, 2008; Hellawell, 2007). Outsider researchers are nonmembers of the organization or community they are researching having no a priori knowledge of either the organization or the participants (Fleming, 2018; Chavez, 2008; Hellawell, 2006). Outsiders were considered to be able to give an 'objective' and 'accurate' account of what was researched in contrast to insiders who were often criticized for holding a biased position due to their closeness to the subjects of the research (Fleming, 2018; Chavez, 2008).

On the other hand, there are scholars such as Naples (1996 in Chavez, 2008, p.476), who claim 'that whether insider or outsider, neither has a monopoly on advantage or objectivity'. Instead, both have to deal with similar methodological issues ((Fleming, 2018; Chavez, 2008), while Hellawell, (2006) argues that ideally the researcher should have qualities both of an insider and an outsider showing both empathy and distancing from the 'researched'. In fact, according to Hellawell (2006), 'insiderism' and 'outsiderism' are the two ends of a continuum, which may refer more to an empathetic, rather than spatial, closeness or distance from the field resulting in varying degrees of either, or the same researcher moving along the continuum during the research. This perspective agrees with scholars such as Mercer (2007) and Floyd and Arthur (2012), who argue that researchers may have simultaneously multiple identities such as gender, ethnicity, class, etc and, thus, move along the two poles on a continuum depending on the way these two poles are conceptualized. In addition, Chavez (2008, p.475) argues that 'qualitative researchers, outsiders or insiders, cannot be assured that their observations, interpretations and representations are not affected by their various identities or positionalities'. On the whole, there are strengths and weaknesses in either of the two researcher statuses (Hellawell, 2006; Chavez, 2008).

Focusing on insider research, scholars contend that it has 'unique methodological advantages' (Chavez, 2008, p.476). Based on Labaree's (2002) categorization the advantages that are most commonly granted to insider research are the following:

a) **shared experiences** between the researcher and the research participants giving the insider researcher a privileged means to establish rapport and develop a level of trust with them (Fleming, 2018; Chavez, 2008; Labaree, 2002).

b) **privileged access** meaning that the need for negotiation that an outsider must perform so as to gain access to the community at the start of the research is minimized. According to Mercer (2007), access is more easily granted to the insider researcher while data collection is less time-consuming. At the same time, due to their membership in the community or organization, insider researchers may have privileged access to critical information (Labaree, 2002; Floyd & Arthur, 2012) since research participants may be more willing and feel more comfortable to share detailed or personal information with an insider feeling that they discuss issues with someone who 'understands' (Fleming 2018). This links to the value of shared experiences mentioned above.

c) **more nuanced insights** into the linguistic, cognitive, emotional, sensory and psychological principles of participants (Chavez, 2008) contributing to what Labaree (2002) acknowledges as the value of cultural interpretation, i.e. the advantages insiderness grants to researchers in terms of their ability to more accurately interpret and represent the culture of a community, and

d) **deeper understanding** and clarity of thought for the researchers with respect to their own work (Labaree, 2002). As Kanuha (2000 in Labaree, 2002) claims a core reason for a researcher to engage in insider research rather than outsider research relates to their desire to make unique and meaningful contributions to their practice, and such contributions could only be achieved

through the development of deep understandings based on their experience in the field.

On the other hand, insider research has also disadvantages, or possible 'complications' due mainly to lack of reflection and monitoring on the part of the researchers with respect to their insider status (Chavez, 2008, p.478). From the reviewed literature, the most common complications attributed to insider research are the following:

a) possible **researcher bias** due to the researchers' closeness to the researched, not holding the distance and objectivity deemed to be necessary for valid research (Brannick & Coghlan, 2007). According to Brannick and Coghlan (2007, p.60), insider researchers 'have a personal stake and substantive emotional investment in the setting', and, thus, they are perceived as not conforming to the standards of research rigor. Their subjective position was believed to lead to overly positive or negligent biases and complicate their ability to observe and interpret with 'accuracy' and 'objectivity' (Chavez, 2008). On the other hand, according to Chavez (2008, p. 475):

> (t)hese assumptions about insider positionality are theoretical, supported by little empirical evidence, and neglect the current trends of thinking in social construction and polyvocality. In truth, little insider research and a lack of development of an insider methodology have failed to systematically describe what insiders actually experience.

Nonetheless, there are issues that must be addressed to minimize any possible biases due to the insider status of the researcher. For example, insider researchers must learn to manage their dual role of being in parallel the researcher and the researched, when outsiders have the advantage of distance from the field and being more easily able to critically observe and interpret (Chavez, 2008; Hellawell, 2006). On the other hand, where the researcher is in a role of power, formal or informal, he/she has to be aware of

and manage the inherent risks involved such as the perception on the part of informants of implicit coercion during recruitment (Fleming, 2018). What is more, if insider researchers in the course of an interview reveal their personal viewpoints, this can distract the informant, encourage their acquiescence, and even 'set(..) up a self-fulfilling prophecy' (Powney and Watts 1987 in Mercer, 2007, p.10). On the other hand, researchers sharing their own experiences could help them build rapport and a level of trust with the research participants (Fleming, 2018).

b) possible **informant bias** during interviews due to how the researcher is perceived or their relationships outside the research context, where the informant may not be willing and comfortable to share information and personal details for fear of being judged, or fearing the impact on their ongoing relationship (Fleming, 2018; Mercer, 2007). On the other hand, while insiderism may offer to the researcher privileged access to the community or organization, it can also act as a constraint to some participants who would be willing to participate (Floyd & Arthur, 2012).

c) the **tensions** the insiders experience between their **dual roles** as professional practitioners and researchers, where active professional engagement with the organization or community contrasts with the need of the researcher to stand back and examine the evidence (Floyd & Arthur, 2012). Brannick and Coghlan (2007) point to the demands this duality of roles makes on the researchers' energy and focus of attention, the doubt experienced regarding the information provided to researchers in confidence due to their professional role, often their strong desire to influence and change the organization of which they are members, the empathy they may be feeling towards their colleagues and the motivation to keep up with the endeavor. Fleming (2018 p.316) claims that it is important for an insider to be aware and manage 'the risks, challenges and tensions during the research process in order to ensure ethical and trustworthy insider research is conducted to achieve the desired outcome'.

Taking the above into account, I was aware of the potential bias and tensions due to my subjective position in the research. Thus, I took a number of steps so as to minimize bias and handle the possible tensions due to role duality. Section 6.8. of this chapter presents a narrative concerning those steps in the form of personal reflections since a great amount of self-reflection was necessary to deal with the potential risks of insider research.

6.5. The sample

The sample of the study consists of eleven EFL secondary school teachers, i.e., i) five Model and Experimental Junior High School EFL teachers, ii) four General Junior High School EFL teachers, iii) a General Senior High School EFL teacher and iv) a Technical Senior High School EFL teacher. This is a balanced sample between teachers of diverse school contexts and qualifications since diversity is a central tenet of EDIT. Teachers of the Model Experimental Schools are especially appointed to these type of schools because of their high academic qualifications, their teaching experience with innovative pedagogical practices such as DI, etc (Ch. C, article 47, FEK 118 -2011, L. 3966/2011). On the other hand, the General and Technical high school teachers are teachers working in typical Greek school contexts having been appointed to their schools on the basis of their University degree only, i.e. EFL teachers. As a result, the eleven participant teachers in the study coming from different school contexts ensured a wider representativeness of teachers of various qualifications and diverse needs strengthening, thus, the validity of the research.

The teachers participated in the study on a voluntary basis as the creation of conditions for teacher autonomy is a core characteristic of EDIT. Thus, an invitation (see Appendix 1) with a detailed description of EDIT stating its nature, purpose, aims and rationale was sent by e-mail to the 22 secondary school EFL teachers of the Model and Experimental Schools of the wider area of Attica, Greece, while for practical reasons of access the supervisor of the study communicated with one of the school advisors of one of the four Attica school regions asking her to e-mail the invitation to some teachers of her choice. A conscious attempt was made to keep the sample size

small between 10 to 15 teachers. The main rationale behind the choice of the sample size was the creation of a bond and a sense of togetherness among the teachers that would not have been possible if the group had a large number of teachers. According to Dube et al. (2006) the small size of a virtual CoP influences positively its formation, development and sustainability. In addition, this is an exploratory study which does not aim at generalizability but to a better understanding of what makes effective TPD on DI.

The sample was deliberately chosen to be teachers of secondary education for the following two main reasons. As it has already been discussed, the majority of Greek students attend tutorial foreign language classes outside public school with the aim to get language certification. As a result, secondary level classes tend to be extremely heterogeneous in terms of students' past learning experiences and their language level making DI a necessary pedagogy. Secondly, the researcher' prior experience with secondary education was deemed as an important asset for her better functioning as facilitator of the particular online CoP. The initial conceptualization of CoPs as a process of becoming a member of a sustained community made special mention to the relationship of a master to his/her apprentices as a dialectical relationship evolving around the process of producing and reproducing learning, thinking and knowing (Lave, 1991). In more modern versions of CoPs, the facilitator appears to play that crucial role of not only coordinating the community's activity but also, as part of the community, listening to, clarifying, and integrating information from the group as well as presenting information in clear and precise language, or asking the 'right' questions and mingling with the group (Bond & Lockee, 2014). Those descriptions of the facilitator's role point to a high level of subject matter expertise justifying our decision for secondary education on the grounds of the facilitator's prior experience as an EFL teacher.

6.6. The methods used for data collection

The methods this study uses to collect its qualitative and quantitative data are, a) a survey using three questionnaires of both closed and open-ended questions to answer

the first and the second research questions exploring teachers' experience with EDIT and mindset transformation, and b) the learning elements that the teachers designed during EDIT to answer the last research question asking about changes in teachers' ability to design differentiated learning elements. The rationale behind the use of questionnaires is that these instruments would allow for the collection of both quantitative and qualitative data investigating the same issues and allowing for data triangulation. What is more, qualitative data obtained from open-ended questions allow for more detailed descriptions and developing a deeper understanding of the issues under investigation, while quantitative data allow for easy quantifiable comparisons between teachers for tracking change from the beginning of EDIT to its end and more objective numerical descriptions giving an overall measure of teacher attitudes and perceptions about EDIT, DI, learners and teaching. Somehow descriptive comparative statistics make up for what Mertens (2015) identifies to be an issue with the validity of the information extracted from questionnaire surveys that rely on individuals' self-reports of their knowledge, attitudes, or behaviors due to their contingency on the honesty or self- awareness of the respondent.

On the other hand, teacher learning elements constitute a special category of EDIT generated data sources, which have the potential of directly answering the third research question about the effect that differentiated TPD on DI has had on the participant teachers' practice. The purpose of the analysis is to track any teacher change and development in their ability to design high quality differentiated curriculums. As Bowen (2009) argues document analysis is a research method particularly applicable to qualitative case studies producing rich descriptions of a single program and providing the means to track change and development through the comparison of various document drafts. What follows is a more detailed look on the three questionnaires developed for this research and the steps followed for the production of the participant teachers' learning elements that are the focus of this analysis.

6.6.1 The three developed questionnaires

This survey collects data from the study participants at three different points in time, a) on 10 October 2016, at the beginning of EDIT, before any intervention took place, b) on 20 February 2017, in the middle of EDIT, after the completion of the first and the second LbD cycles, and c) on 21 December 2017, at the end of EDIT, after the completion of the program. The scarcity of literature research on the area of differentiated TPD on DI resulted in the absence of any existing instruments measuring the synthesis of constructs of this study's interest, so new instruments had to be developed for the purposes of this research. Overall, the purpose of the three developed instruments of the study was:

a) to draw the demographic profile of the participant Greek EFL secondary school teachers before the intervention and their starting point in relation to DI

b) to explore and understand the participant teachers' perspectives about their online EDIT experience at two different points in time, i.e., in the middle and at the end of the program

c) to track teacher change towards more open to diversity mindsets from the beginning of EDIT to its end

What follows is a detailed description of the development of each of the three questionnaires used in the survey of the study.

6.6.1.a.The first questionnaire: before EDIT

The first questionnaire (see Appendix 2) has been designed to collect data for the second research question, which attempts to draw the participants' profile before EDIT and track EDIT effectiveness in transforming teachers' differentiation related mindsets and practices. The questionnaire has five parts, each with a different focus. The first part, the *Personal Profile*, consists of four open-ended and eight multiple choice questions which intend to elicit information on the participating teachers' demographic profiles such as their name, age, educational background, teaching

experience, level of proficiency in Information Technology, previous professional development experiences, any previous training on DI and their familiarization with the Integrated Foreign Languages Curriculum. Such data are considered important for delineating the participating teachers' profile in terms of their qualifications and expertise.

The second part of the questionnaire, the *Teaching Context*, consists of six mixed closed-ended and open-ended questions aiming to further explore the participating teachers' profile particularly in relation to their Greek public school teaching context and DI. The purpose of this section is to draw the picture of the teachers' school context in relation to their Greek EFL secondary school classes' perceived homogeneity, the areas of student diversity and the school textbooks' usefulness in helping teachers differentiate, the value teachers place on DI, whether they perceive themselves as differentiating their teaching, in what ways they do so, and the reasons for not doing so.

The third part, the *Teacher Attitudes and Beliefs*, consists of a) five open-ended questions, which ask the teachers to complete five different sentences by writing a specified number of words that come to their mind when reading them, and of b) fifteen closed Likert-five-item statements on which they are asked to indicate their degree of agreement or disagreement (strongly agree to strongly disagree). The open-ended questions (C1 and C2) seek to explore teacher perceptions about student diversity between struggling and advanced students and their role as teachers. The purpose of this set of questions is to explore possible teacher stereotypical perceptions of their different students underlying their own fixed or growth mindsets, which are considered important for their ability to differentiate effectively. The rationale for asking teachers to describe student differences with the use of solely some adjectives was to help focus teachers' descriptions on what they perceived as core qualities characterizing students with different results in their achievement. On the other hand, Dweck's (2012) research has shown that people who hold a growth mindset about other people's traits tend to understand and interact better with diversity understanding others' behavior in terms of situations and psychological

processes such as needs, beliefs, emotions, motives etc rather than in terms of person-traits. Thus, the analysis was based on the teachers' choice of words as representative of their thinking behind.

The C3 part has two main foci. First, it further explores teachers' fixed or growth mindsets concerning their assumptions about the fixed or changeable nature of their students' ability and intelligence, and their own ability and potential to contribute positively to student ability and intelligence change. This set of questions are an adaptation from Dweck et al.'s (1995) work and instrument on implicit theories about attributes such as intelligence and moral character and their role in judgement and reactions. Secondly, C3 involves another set of questions that explore teachers' degree of awareness of student diversity along their different starting points, their interests, their preferred ways of learning, and what it means to give all students equal opportunities to learn.

The fourth part, *Teacher Knowledge about Different Student Needs*, consists of eleven closed Likert-five-item statements where teachers are asked to indicate their degree of agreement or disagreement from strongly agree to strongly disagree. The purpose of this set of questions is to capture teachers' understanding of how students learn according to the principles of DI with statements such as question 5 'Students have preferences for different ways of learning and teachers will be more effective, if they can offer those options to their students', or question 9 'The inclusion of different student interests is crucial to successful EFL learning'. The fifth and final part of the questionnaire, Teacher Practices, consists of twenty-three closed Likert-five-item statements where teachers are asked to indicate the frequency of application in their Junior High School classes from always to never. The purpose of this set of questions is to capture teachers' reported practices of various DI aspects such as planning in advance different approaches to teaching course content, offering different choices to learning, providing extra material to support students, purposefully grouping students based on their preferred ways of learning, or taking special care to create the conditions for students to feel autonomous and self-regulated. The data collected from this part are intended to be used in order to draw a more complete picture of

the participating teachers' profile at the beginning of EDIT before EDIT intervention took place. The construction of this part of the questionnaire is greatly based on Santangelo and Tomlinson's (2012) questionnaire which was designed to reflect Tomlinson's model of differentiation used in their study to explore teacher educators self-reported beliefs and practices related to differentiated instruction.

6.6.1.b. The second questionnaire: in the middle of EDIT

The second questionnaire (see Appendix 3) has been designed to collect data for the first research question relating to teachers' experience with EDIT. As it is stated in the introductory paragraph of the questionnaire, which was distributed after the completion of the first two LbD EDIT cycles, the teachers' responses to the questionnaire constituted an invaluable source of data for the evaluation of EDIT and an indicator of its possible impact on TPD on DI. It attempts to capture the whole of their experience with a series of open-ended questions focusing on different dimensions of the program. In this introductory note, special care was taken to make it explicit to the respondents that the researcher and teacher educator did not hold any particular expectations regarding the participants' answers other than the true nature of their experience so as to facilitate the respondents feel free to express their perspectives as openly and holistically as possible.

The second questionnaire consists of three distinct sections. The first section, *Describe Exploring DI Together*, was designed to answer the first research question and attempt to understand how the participants perceived their whole EDIT experience. It consists of ten open-ended questions which seek to capture the teachers' perceptions of EDIT both in a holistic and a focused manner. For example, the first question of the questionnaire asks teachers to write how they would describe EDIT in their own words. This is the very first question of the questionnaire and it attempts to capture the teachers' first overall impression of EDIT before the more focused questions begin. In contrast, the second and the third questions ask teachers to consider specifically EDIT's positive and negative attributes consecutively while the ninth and tenth questions focus teachers' attention on the content and tasks of EDIT asking them to

describe them using a few adjectives. The use of adjectives aims to capture in a more concrete manner the essence of the teachers' experience with the content and tasks of EDIT. The fifth question asks what experiences of EDIT they would describe as new professional development experiences for them with the aim of capturing the EDIT experience within the broader Greek professional development context. The sixth and seventh questions seek to capture the demands that EDIT made on teachers time and amount of work they had to do. Finally, the eighth question attempts to capture a more overall evaluation of EDIT asking them whether they would recommend EDIT to other teachers having to justify their answers.

The second section of the questionnaire, *Reporting on the Value of Exploring DI Together,* follows the rationale of Wenger et al.'s (2002; 2011) framework for measuring the value that CoPs create for their members. The framework, which Wenger et al. (2002; 2011) call value creation cycles, is actually an evaluation tool that follows a specific cause and effect format for exploring members' experience within a CoP in an attempt to impose order and coherence to the stream of experience within a CoP and facilitate its participants to recount it. In consequence, the second section of the questionnaire consists of four sub-sections. It starts with part A *Immediate Value – Activities*, which focuses on key EDIT activities that have had an effect to the participant teachers and which they identify as influential or significant in the course of their professional development experience. The third and the fourth questions attempt to explore in greater detail the role that the community played in teacher learning. Part B *Potential Value – Knowledge* turns the focus on key knowledge acquired during EDIT. The purpose of this section is to capture any valuable knowledge, understandings and 'aha' moments developed as a result of EDIT together with influential material or sources of information which could potentially have an effect on later teacher practice.

The following two sub-sections, part C *Applied Value – Change*, and part D *Realized Value – Performance Improvement,* actually consist of one open-ended question each and attempt to explore the effect of EDIT in teacher practice. In particular, they attempt to explore how the knowledge described in Part B was applied in practice and

168

with what effect, and, then, the effect that a particular application has produced in practice. The question uses some prompts to help teachers reflect on EDIT's applied effect such as '(w)here have I used the products of the community', or '(h)ow was an idea or suggestion implemented? At what level – individual, team, organization?'. On the other hand, Part D explores the effect that the implementation of an idea had to the students. The question seeks to collect data about the effect of teacher scaffolded implementation of DI throughout EDIT on their actual classes and students. The questionnaire does not collect any data on the final value creation cycle of Wenger et al's (2002; 2011) framework, the reframed value cycle, which refers to any redefinition of what is perceived as success in view of developments in the previous cycles, because it is out of the scope of this study since any such reframing would take time to develop.

Finally, the third section, *Rating Exploring DI Together*, seeks to further explore the answer to the first research question through the collection of quantitative data. The section consists of twenty-five Likert-type questions asking teachers to rate their degree of satisfaction in a number of statements in a scale of 1 (minimum) to 10 (maximum). The purpose of this section is to explore EDIT effectiveness in being intrinsically motivating, meaningful and transformative to teachers. It seeks to explore teachers' degree of satisfaction in relation to a number of different EDIT aspects that tap aspects of intrinsic motivation, meaningful learning and transformative learning. The focus on teachers' satisfaction with EDIT is considered an important measure of EDIT effectiveness. Thus, teachers are asked to report on their degree of satisfaction with statements such as how intrinsically motivated they felt with EDIT, how competent and efficacious they felt, the way EDIT challenged them, the way they felt more inspired by the work they do, how autonomous and self-regulated they felt, the way it addressed their interests and learning preferences, their sense of belonging to the group, their interaction with others, the way they trusted others within the community, the way they felt less isolated, and their overall experience with the program.

Special emphasis has been given to the exploration of EDIT effectiveness in being meaningful and transformative to teachers, two aspects that inherently relate to the satisfaction of competence and autonomy needs respectively and two of the main EDIT aims. EDIT effectiveness in being meaningful to teachers is explored with asking teachers to report their degree of satisfaction with the way EDIT was meaningful to them, it drew connections to their previous knowledge, it addressed essential knowledge, it was practice-focused and balanaced theory and practice, it was relevant to their professional needs, the way they reached deep understandings, and the way they had access to new tools, methods, or documents and sources of information. On the other hand, EDIT effectiveness in being transformative for the teachers is explored by asking teachers to report their degree of satisfaction with their learning and development, the development of their self-reflection, the way EDIT changed their understanding of their students' different needs, and the way they learned from their colleagues within the community.

6.6.1.c.The third questionnaire: after EDIT

The third questionnaire (see Appendix 4) was distributed after the completion of EDIT and it has been designed to collect data for answering all three of the research questions. Following the rationale of a longitudinal research design, the third questionnaire is a blend of the previous two instruments, the first and the second questionnaire, using the same empirical indicators so as to capture any changes in comparison to the data collected before the beginning of EDIT and in the middle of EDIT right after the completion of the first two LbD cycles. The purpose of the third questionnaire is to explore, a) teacher perceptions of their experience and b) changes in the participant teachers' DI related mindsets and practice. As a result, the biggest part of the third questionnaire consists of overlapping sections of the first and the second questionnaires. However, in order to keep the third questionnaire at an appropriate user friendly length some changes had to be made. So, the largest part of the *Personal Profile* section together with the final *Teacher Practices* part of the first questionnaire has been extracted since they mainly served purposes of data collection for making up the participant teachers' profile. In addition, the sections *Describe*

*Exploring DI Togethe*r and *Reporting on the Value of Exploring DI Together* of the second questionnaire have been merged into one section *About Exploring DI Together*, with twelve questions extracted and three new ones added.

As a result, the first and the second part of the third questionnaire, which have kept the labels *Personal Profile* and *Teaching Context,* consist of the first questionnaire questions that explored teachers' perceptions and practices with regards to DI so as to track any changes in teacher DI perceptions and practices after the EDIT experience. The third part, *Teacher Attitudes and Beliefs*, consists of the same first questionnaire questions exploring change in teacher perceptions about student diversity between struggling and advanced students, change in teachers' fixed or growth mindsets, and change in teacher awareness of student diversity with respect to different starting points, interests, etc. The fifth part, *About Exploring DI Together*, attempts to understand how the participants perceived their whole EDIT experience. It consists of nine open-ended questions which seek to capture the teachers' perceptions of the whole EDIT experience. This section which is a merge of *Describe Exploring DI Together* and *Reporting on the Value of Exploring DI Together* of the second questionnaire seeks to capture the essence of EDIT experience through the participant teachers' different perspectives throughout the programme. The more focused questions of the second questionnaire, which asked about teachers' perceptions of EDIT tasks, content, time and amount of work have been extracted on the basis of keeping the third questionnaire, i.e. a merge of the first and the second, at an appropriate length for teachers to complete in a reliable manner balancing costs and benefits and deciding to give prominence to teachers' perceptions of the overall EDIT experience rather than any concrete events or activities.

The largest part of *Reporting on the Value of Exploring DI Together* has also been extracted on the grounds that the data collected from the second questionnaire could report on the value that the EDIT CoP created for its members. There have been kept the questions asking teachers to describe EDIT in their own words, to consider EDIT's positive and negative attributes, to identify the experiences of EDIT they would describe as new professional development experiences for them, whether they would

recommend EDIT to other teachers, and two questions about the effect that EDIT have had on their practice referring to acquired skills and knowledge and any 'aha' moments experienced during the program. The above two questions were retained from the second questionnaire, *Potential Value*, because they seek to collect data on teacher gained knowledge and understandings through EDIT that no other method could collect. The ninth question, which is an open-ended question is a new question that is absent from the second questionnaire but is categorized under the *Applied Value* category of Wenger et al's (2002; 2011) framework seeking to explore the effect of EDIT in teacher practice. The question is split into three sub-questions and asks teachers what they keep from the whole EDIT experience asking about their lesson planning, the principles they apply in their everyday practice and whether they have seen any changes in them as teachers, and their interaction and collaboration with colleagues at their schools.

The final section of the third questionnaire, *Rating Exploring DI Together*, is a shorter version of the twenty-five Likert-type scales asking teachers to rate their degree of satisfaction in a number of statements about their basic affective needs of competence, autonomy and sense of belonging in a scale of 1 (minimum) to 10 (maximum). The data collected was compared and contrasted with the data collected from the second questionnaire with the aim of exploring the answer to the third research question, i.e., to what extent EDIT addressed different teachers' needs throughout all four of the LbD cycles. This time, the teachers were asked to answer fourteen only of the initial twenty-five questions in an attempt to keep the final questionnaire at a user-friendly length keeping the set of questions that were considered core for measuring teacher satisfaction with EDIT at the end of the programme without missing out on any essential data.

6.6.2. Teacher learning elements before and after EDIT

In the middle of EDIT right before the beginning of the 3rd LbD cycle, the 11 teachers were asked to choose and represent in the form of a learning element any one of their teaching hours of the Think Teen state book taught in all Greek EFL junior high school

classes. After designing their first learning elements (from now on referred to as before EDIT intervention), the teachers were exposed to meaningful learning principles of curriculum design, the focus of the 3rd EDIT cycle, through their involvement in a series of LbD knowledge processes within the context of EDIT CoP. At the end of the 3rd cycle, they were asked to apply appropriately these meaningful learning curriculum design principles by working in pairs for the design of a second Think Teen learning element, which would pay particular attention to the cognitive processes it involved students. After designing these pair learning elements, the participants were divided into two groups and were asked to present their learning elements to the teachers of the other group with the aim of giving and getting critical feedback for the refinement of their end products. At the end, they were asked to individually compare and contrast their pair learning elements with the learning elements each submitted at the beginning of the 3rd cycle in a process of self-reflection and further comprehending meaningful learning principles.

The 4th LbD cycle built on the third cycle proposing the LbD template as a concrete tool for the design of high quality differentiated curriculums which addresses learners' different learning styles and multiple intelligences. At the end of the 4th EDIT cycle, the teachers were given a choice to redesign individually or in pairs the Think Teen learning element they had planned in pairs at the end of the 3rd cycle through appropriately applying the LbD knowledge processes so as to practice and deeper understand the LbD rationale. At the closing of the program for the summer, at the end of June, the teachers were assigned their final EDIT task (from now on referred to as the after EDIT teacher learning elements) to apply creatively their EDIT knowledge and design a new differentiated lesson unit on a topic of their choice by synthesizing –and creatively transforming what they had learned so far with the intention to implement it in one of their classes by the middle of October, before the last community meeting. This is the after EDIT learning element used in the analysis to track teacher change compared with their first learning element designed before the beginning of the 3rd cycle. Teacher lesson planning is part of teacher everyday practice. Thus, the learning elements designed by the participants before EDIT and after EDIT

are considered a direct empirical indicator of those teachers' professional development and learning about DI.

6.7. The data analysis methods of the study

The study's quantitative data were analyzed using descriptive statistics, whose function is to describe several characteristics common to the entire sample summarizing data on a univariate mean (Mertens, 2015). Overall, the study's quantitative findings summarize in numbers, a) the teachers' demographic and DI profile before entering EDIT, b) the teachers' mindset change after the program, and c) their subjective perceptions of the EDIT experience. On the other hand, the method of analysis used for qualitative data is a method used with textual types of data such as open-ended survey questions (Kondracki, et al, 2002). Content analysis was used for the analysis of both the questionnaires and teachers' learning elements. Content analysis is a method that 'provides a systematic and objective means to make valid inferences from verbal, visual, or written data in order to *describe* and *quantify* specific phenomena' (Downe-Wamboldt, 1992: p.314). The aim of the study's content analysis was to describe, a) the participant teachers' experience with EDIT, b) their mindset change, and c) their ability to design differentiated learning elements. The following sections present and discuss in greater detail the analytical processes of the study.

6.7.1. Descriptive statistics of the questionnaires

Sections *A. Personal Profile*, *B. Teaching Context*, and *E. Teacher Practices* of the 1st questionnaire were analyzed using descriptive statistics to quantitatively summarize teachers' demographic profile, their previous experience with TPD and DI, their perceptions about DI and differentiation practices at the beginning of the program. The aim of this analysis was to draw an accurate profile of the participants at the beginning of EDIT so as to more accurately interpret the rest of the findings concerning teachers' perspectives about their EDIT experience and the possible changes tracked after the completion of the program.

The third section of the 2nd and 3rd questionnaires, *Rating Exploring DI Together*, were also analysed using descriptive statistics describing in numbers a) to what extent the participant teachers felt that EDIT succeeded in being intrinsically motivating and addressing their basic affective needs of competence, autonomy and sense of belonging, b) how meaningful and transformative they perceived it to be. The descriptive statistics compared and contrasted the participant teachers' perceptions of their EDIT experience in the middle, i.e.at the end of the 2nd LbD cycle, and the end of the program with the aim to track any changes and fluctuations in teachers' perceptions of various EDIT aspects. These results were triangulated with the findings of the relevant qualitative data, i.e. the open-ended questions of the 2nd and the 3rd questionnaire asking about the EDIT experience.

Sections *C. Teacher Attitudes and Beliefs a*nd *D. Teacher Knowledge about Different Student Needs* of the 1st and 3rd questionnaire were analyzed using descriptive statistics to track changes in attitudes, beliefs and knowledge concerning teacher openness to diversity. These results were triangulated with the findings of the analysis of the open-ended questions of the 1st and the 3rd questionnaires asking about teacher openness to diversity.

6.7.2. Qualitative content analysis of the questionnaires

Content analysis of the qualitative data taken from the questionnaires started with coding. The unit of analysis used for coding was the paragraph unit since the teacher's answers to the open-ended questions took the form of short paragraphs. Coding involved labelling the meaning unit with a descriptive code which stayed close to the original text and on a low level of abstraction. Codes are words or short phrases that symbolically assign 'a summative, salience, essence-capturing, and/or evocative attribute for a portion of language-based or visual data' (Saldana, 2013, p.3). The data were carefully read and de-contextualised dividing the original text into meaning units, which were then coded and eventually sorted into categories (Lindgrey et al, 2020). A meaning unit is defined as the constellation of words or statements that relate to the same central meaning (Graneheim & Lundman, 2004). As a result, when one paragraph contained two or more ideas, it was counted as two or more separate

meaning units (see Hara, Bonk and Angeli, 2000 in Rourke et al, 2001). It is important to note that the analysis of the data took special care so as to look at all the data across the codes without ignoring any chunks that did not 'fit' following Coffey and Atkinson's (1996,p.47) rationale that

The exceptions, misfits, and 'negative' findings should be seen as having as much importance to the process of coding as do the easily coded data.

The analysis examined the manifest content, i.e. the content that was literally present in the text and visible at the surface level using an inductive approach grounded in the data in a more open and organic way (Kondracki, et al, 2002). In other words, the coding method used followed basic grounded theory guidelines applying and creating codes in a more open and organic way by having no previous ideas of what to look for in the data while scrutinizing and interpreting them. According to Charmaz (2006), whose starting point is grounded theory analysis, the advantages of such an initial coding is fit and relevance in the sense that the study fits the empirical world having constructed codes and developed them into categories that crystallize the participants' experience. This approach is considered appropriate because there are no predetermined categories of how the participant teachers of a differentiated TPD program on DI perceive their experience with differentiation since the literature on the phenomenon is limited. It is actually one of the first studies exploring teacher perceptions of their experience with differentiated TPD on DI so the inductive development of codes as they are derived from the data is considered essential.

The second step was to group those initial codes into categories building systematic comparisons and contrasts between the views expressed from teachers at different time periods, i.e. before, in the middle or after EDIT. Comparisons move the researcher to think analytically about the data thinking more abstractly about what properties the bits of data share in common and what is different about them rather than describing the specifics of a case (Charmaz, 2006; Strauss and Corbin, 1998). The final step was to see how the emergent categories could be further categorized into themes in relation to the constructs of the study. At this stage, the focus of the analytic

process has been the identification of common themes emerging in all of the participant teachers' answers. The validity of the results is confirmed by the use of rich examples taken from the original text across all categories and by relating them to the relevant theory (Downe-Wamboldt, 1992). This study's theory assumed that a transformative, meaningful and intrinsically motivating program could cause teacher gradual change from non-openness to openness to diversity.

It is only in the second section, *Reporting on the Value of Exploring DI Together*, of the second and the third questionnaire that the starting point of the analysis was a preliminary coding for 'facilitating factors', 'hindering factors', 'EDIT effects', and 'other' since the focus of this section pertained to the understanding of what teachers perceived to be contributing and hindering factors in their TPD experience with EDIT and what had been the effects of such an experience. It is important to note that both the collection and the analysis of the data took special care so as to include both positive and negative attributes of EDIT.

6.7.3. Quantitative content analysis of the three questionnaires

For the analysis of the quantitative questionnaire data, the study used quantitative content analysis, i.e., counting of meaning units in order to measure the frequency, the intensity such as the relative emphasis given on various topics, or the amount of space devoted to certain topics, etc (Kondracki, et al, 2002; Downe-Wamboldt, 1992). For example, the analysis of the participant teachers' experience with EDIT involved counting the meaning units to determine the following:

a) Teacher frequencies, i.e. the number of teachers who perceived and referred to any of the emergent EDIT qualities constituting the qualitative categories of the first part of the analysis so as to measure the impact of the different EDIT qualities on teachers, and, thus, how successful has EDIT been in creating the necessary conditions for learning according to DI principles.

b) The amount of space devoted to each quality, i.e. the total amount of instances in total and per teacher referring to a particular EDIT quality in the middle and the end of the program. These measures determined the intensity of occurrence of each EDIT quality and complemented teachers' frequencies in giving a more complete picture of EDIT's impact on teachers and its success in differentiating instruction.

6.7.4. Qualitative content analysis of the learning elements

The method employed in the study to analyze teacher learning elements *before and after EDIT* was qualitative content analysis. *For the analysis, it was necessary to develop a scheme of* predetermined criteria pertaining to the second level of DI, i.e. planning a high-quality differentiated learning element (see Chapter 2) so as to code the data and analyse each learning element taking into consideration this predetermined scheme (see Table. 6.1 below). The analysis was initially within-teacher focused starting with comparing and contrasting teachers' before and after EDIT learning elements so as to track changes in their ability to design for differentiation, and then moved to comparisons across all eleven teachers' lesson designs before and after their differentiated TPD on DI.

To be more explicit, for the purposes of this dissertation the researcher developed a scheme of evaluation criteria involving three main categories of development of teachers' ability to design **differentiated quality learning elements.** The scheme depicts three levels of criteria for the evaluation of teachers' competency in designing differentiated meaningful learning elements. The three categories refer to

a) low intellectual quality and *undifferentiated* learning elements,
b) semi-intellectual quality and *developing differentiated* learning elements,
c) high intellectual quality and *differentiated* learning elements.

Each of the three categories for the evaluation of the teachers' competency in designing effectively differentiated learning elements is divided into two parts. The

first part involves the evaluation criteria to a learning element's meaningfulness, or else, intellectual quality and the second part refers to the criteria for its quality of differentiation. These two parts accord with this study's identification of a) meaningful learning (see 2.9.1), and b) responding to learner diversity (see 2.9.2) as the two main steps for other two categories, which were standing in the two extremes. What follows is a closer look at the criteria of each of the three categories.

The first indicator of the learning element's intellectual quality refers to its level of *coherence,* i.e. the extent that it is well thought-out and clear on what students are expected to do and know by the end of the lesson having set clear understanding objectives, identified the essential knowledge and sequenced the activities in an increasing breadth and depth of understanding creating a unified learning whole (Wiggins and McTighe, 2005; Tyler, 1949). Thus, a learning element is categorized as a) *coherent* when it is well thought-out and clear on what students are expected to do and know by the end of the lesson setting clear and concrete understanding aims, a guiding essential question, and having a logical progression of activities, which are

Undifferentiated Learning Element Planning	Developing Ability	Differentiated Learning Element Planning
Low Intellectual Quality	**Medium Intellectual Quality**	**High Intellectual Quality**
1. <u>Incoherent</u>: Not well thought-out or clear on what students are expected to do and know by the end of the lesson • *no objectives* • *abstract & vague objectives on what students are expected to do or know by the end of the lesson* • *unrealistic objectives in terms of time* • *uneven progression of activities which is not aligned with the lesson objectives*	*1. <u>Semi Coherent</u>: different combinations of low & high intellectual quality indicators* *e.g.* • *clear understanding aims and/or objectives* • *uneven progression of activities* *e.g.* • *abstract or no aims and/or objectives* • *clear structure & logical progression of activities*	*1.<u>Coherent</u>: well thought-out and clear on what students are expected to do and know by the end of the lesson* • **clear & concrete** *understanding* **objectives** on what students are expected to do or know by the end of the lesson (Wiggins & McTighe, 2005) • **essential questions** on lesson's essential knowledge focusing the lesson tasks (Wiggins & McTighe, 2005) • **logical progression of activities** aligned with lesson objectives • creating a **unified whole**, which **advances student learning** & covers the lesson's essential knowledge (concepts) throughout (Gibbons, 2008; Wiggins & McTighe, 2005; Tyler, 1949)
2.<u>Learner Irrelevant</u>: learning irrelevant and unconnected to learner lifeworld • *new learning unconnected with prior learner experience & lifeworld* • *it starts with prior learner knowledge with respect to new learning (not learner lifeworld such as prior experiences, interests, etc)* • *closed-ended tasks aiming to get content 'right'; give one right answer* • *no transfer to students' real life & novel situations*	*2. <u>Semi Learner Relevant</u>: different combinations of low & high intellectual quality indicators* *e.g.* • *new learning unconnected with prior learner experience, or starting with prior learner knowledge* • *open-ended tasks*	*2. <u>Learner Relevant</u>: welcomes learners' lifeworld into learning (Kalantzis & Cope, 2016)* • **it starts by connecting <u>learner lifeworld (i.e. prior learner experience, interests)</u>** with new learning (Ausubel, 2000; Gagne et al, 1993; Getha-Eby, 2014) • **open-ended tasks** involving learner interests, experiences, feelings, perspectives, etc (Reeve, 2009) • **transfer** to students' real life & novel situations (Wiggins & McTighe, 2005)

3.<u>Building on Knowledge Acquisition</u>: *focuses on learners' content, grammar, vocabulary knowledge acquisition only* • *factual knowledge only,* i.e.it *emphasises isolated bits of information; terminology; specific details; form-focused* • *work-focused; purposeless doing of exercises* • *it involves learners in lower-order thinking <u>only,</u> e.g. **recalling or remembering info,** Identifying, listing, defining*	***3. Building Partial <u>Understanding</u>:*** d*ifferent combinations of low & high intellectual quality indicators e.g.* • ***concept-based*** • ***not draw interconnections between concepts a part of a coherent whole i.e. partial understanding*** • ***not thorough exploration of concepts*** • ***concepts not connected with particular facts, information***	*3.* **Building on <u>Understanding</u>:** focuses on learner understanding of 'big ideas' necessitating higher-order thinking; students acquire & process factual info through the conceptual level of thinking • **concept-based**, i.e. it emphasizes broader, cross-curricular and transferrable essential ideas (Wiggins & McTighe, 2005; Ausubel, 2000; Getha-Eby, 2014; Gibbons, 2008) • **it draws interconnections** between concepts and/or across subjects, i.e. interdisciplinary, as part of a coherent whole; **Time (teaching periods)** • it involves learners in challenging **higher-order thinking** (Gibbons, 2008; Wiggins & McTighe, 2005) e.g. • **Understanding (Bloom, 1956), Conceptualizing by Naming & by Theory (Kalantzis & Cope, 2004), i.e. organizing concepts into coherent interpretative systems:** *e.g. explaining, questioning, comparing, contrasting, classifying* • **Applying (Bloom, 1956; Kalantzis & Cope, 2004), i.e. transferring theory into practice; applying appropriately:** *e.g. using, writing, illustrating, solving* • **Analysing (Bloom, 1956), Analysing Functionally(Kalantzis & Cope, 2004), i.e. distinguishing between the different parts; analysing functionally**: *e.g. criticizing,*

181

		differentiating, testing, examining, figuring out cause-effect • **Evaluating, (Bloom, 1956), Analysing Critically(Kalantzis & Cope, 2004) i.e. justifying a stand or decision**: *e.g. arguing, supporting, judging, interrogate (interests, motives, ethics, etc)* • **Creating (Bloom, 1956), Applying Creatively (Kalantzis & Cope, 2004), i.e. imagining new perspectives; mixing & matching the familiar into unusual, original ways; applying creatively:** *e.g. designing, producing, formulating, making*
Undifferentiated	**Developing Differentiation**	**Effectively Differentiated**
1.Providing singular learning pathways: *a) Use of One Learning style: it does not make space for learner different styles and involves them only in processes of thinking* b) **Use of One modality in learner Input, Processing, Output: i**t does not make space for learner different MI and involves them only in *written-linguistic modes of meaning making* *c) A* s*ingular Foreign Language Readiness Option: it provides learner input, processing and/or output for one language proficiency level*	*It involves a minimum number, i.e. one or two different differentiation indicators* *e.g.* *1. Providing a small variety of learning pathways:* it provides two different combinations of learning pathways such as different learning styles, multimodality and/or EFL proficiency level options.	**1. Providing of a variety of learning pathways:** **a) Various Learning Styles**: makes space for learner different learning styles and involves them in processes of *experiencing, reflecting, thinking, and/or acting(Kolb & Kolb, 2009; Tomlinson, 2001)* *b) Multimodal learner Input,* **Processing, Output: m**akes space for learner different MI by involving in multiple meaning making modes written-linguistic modes of meaning interface with *oral, visual, audio, gestural, tactile & spatial patterns of meaning (Kalantzis & Cope, 2004; Gardner, 2000; Tomlinson, 2001)* *c)Multiple Foreign Language Readiness Options: it provides different language proficiency options for learner input, processing and/or output*

		2. Fostering Learner Autonomy: *provision of options welcoming student thoughts, feelings, and actions (Reeve, 2009), inclusion of student interests in learning (Tomlinson, 2001), student empowerment through self-reflection opportunities (Cranton, 1996)*
2. Fostering Teacher Directed Learning: it provides • *no options,* • *no inclusion of student interest,* • *no self-reflection opportunities* • *teacher telling; teacher control; transmissiveness*	***2. Developing learner autonomy:*** it provides a combination of teacher control and learner autonomy support with a limited number of learner options, and/or self-reflection opportunities.	
3. Fostering Individual learning only: it provides no opportunities to • *share experiences, feelings, perspectives with others;* • *collaborate and negotiate perspectives with others;* • *co-create*	***3. Developing learning with others:*** it provides a singular social learning opportunity.	**3. Fostering Learning with others:** provision of opportunities to • *share experiences, feelings, perspectives with others (Kalantzis & Cope, 2012);* • *collaborate and negotiate perspectives with others (Mezirow, 1997);* • *group-work; pair work (Tomlinson, 2001)*

Table 6.1 A scheme of criteria for the evaluation of teacher's competency in designing high-quality differentiated learning elements constructed by the researcher based on the literature review resulting in the study's conceptualization of differentiated instruction.

the design of high-quality differentiated learning elements. Intellectual quality refers to the quality of the learning elements' meaningfulness following Gibbons (2008) definition of the concept of intellectual quality by making reference to core meaningful learning dimensions (see 2.9.1). The construction of the categories started with the identification of the criteria of what makes a high-quality differentiated learning element grounded on the study's exploration of the second level of DI (see 2.9). Then, it moved on to the exact opposite category of low intellectual quality undifferentiated learning elements by identifying the characteristics of traditional classroom learning like rote learning, the provision of singular learning pathways, etc (see Chapters 2 and 4). Then, a middle category was

created representing developing teacher ability by combining characteristics of the

aligned with the lesson objectives and create a unified whole, which advances student

learning, b) *incoherent* when it is not well thought-out or clear on what students are

expected to do and know by the end of the lesson setting vague or no objectives and showing an uneven progression of activities, which are not aligned with the lesson objectives, and c) *developing coherence* when it reveals a combination of low & high intellectual quality such as having clear objectives but an uneven progression of activities, or abstract or no explicit objectives but a clear structure where activities logically align with each other.

The second indicator of the learning element's quality refers to its level of *learner relevance,* i.e the extent that it welcomes learners' lifeworld into learning connecting their experiences, interests, feelings, perspectives with new learning and transferring it back into their real life contexts (Kalantzis and Cope, 2016). Thus, a learning element is categorized as a) *learner relevant* when it welcomes learners' lifeworld into learning with open-ended tasks, which invite learner interests, experiences, feelings, perspectives into learning, b) *learner irrelevant* when the learning taking place is irrelevant and unconnected to the learners' lifeworld not connecting learner real world experiences with new learning and with mainly closed-ended tasks which aim for students to give one right answer, and c) *developing learner relevancy* when it reveals a combination of low and high intellectual quality indicators of learner relevancy such as the inclusion of open-ended tasks but making no attempt to connect learner real world experiences with new learning focusing solely on prior learner knowledge.

The third indicator of the learning element's quality refers to its level of *building learner understanding,* i.e. the extent that learning focuses on learner understanding of the 'big ideas' necessitating higher-order thinking or focuses on knowledge acquisition (Wiggins and McTighe, 2005; Gibbons, 2008; Anderson et al, 2001; Ausubel, 2000; Bloom, 1956; Kalantzis & Cope, 2004). Thus, a learning element is categorized as a) *building understanding* when it focuses on learner understanding of 'big ideas' necessitating higher-order thinking (e.g. Bloom's taxonomy, LbD knowledge processes) and students acquire and process factual information through the conceptual level of thinking drawing interconnections between different concepts to build understanding of a coherent whole usually across time, i.e. a number of teaching

hours, b) *building knowledge acquisition* when it focuses on learners' content, grammar, vocabulary knowledge acquisition only putting emphasis on isolated bits of factual information, purposeless doing of exercises and involving learners only in lower-order thinking such as recalling of prior knowledge, identifying the correct answer, listing information, etc, and c) *developing understanding* building when it reveals a mix of low and high intellectual quality indicators such as being concept-based but not succeeding in drawing interconnections between different concepts as part of a coherent whole and remaining at a mainly superficial level of understanding.

The first indicator of the learning elements' differentiation quality refers to the number of *different pathways to learning* provided to learners, i.e. addressing learners' multiple intelligences, learning styles or even readiness needs through a variety of multimodal representations, different language options or learning pathways such as thinking, experiencing, reflecting and/or acting (Gardner, 2000; Tomlinson, 2001; Cope and Kalantzis 2009; Kolb and Kolb, 2009). Thus, a learning element is categorized as a) *providing a variety of learning pathways* when it provides learning through different learning styles such as thinking, experiencing, reflecting and/or acting, multiple meaning making modes, and/or multiple EFL proficiency level options, b) *providing singular learning pathways* when it makes use of one learning style, i.e. usually thinking in the traditional manner, one modality for knowledge input, processing and learner output, i.e. usually the written-linguistic mode, and a singular EFL proficiency level option for input, processing and/or learner output, and c) *providing a small variety of learning pathways* when it provides a maximum of two or three different combinations of learning pathways such as different learning styles, multimodality and/or EFL proficiency level options.
The second indicator of the learning element's differentiation level refers to the
 extent of support to *learner autonomy* provided to learners, *i.e. the provision of options welcoming student thoughts, feelings and actions, the inclusion of student interests, and student empowerment through self-reflection opportunities (Reeve, 2009; Pintrich and Schunk, 1996; Hidi & Renninger, 2006 in Hidi, 2006; Krapp, 2002 in Hidi, 2006; Cranton, 1996)* . Thus, a learning element is categorized as a) *fostering learner autonomy*, when it provides learners options, opportunities for self-reflection

and self-growth and opportunities to include their own interests in their learning, b) *fostering teacher directed learning* when it supports teacher transmissiveness and control with lots of teacher telling giving learners no opportunities to choose, self-reflect or include their own interests in their learning, and c) *developing learner autonomy* when it provides a combination of teacher control and learner autonomy support with a limited number of learner options, and/or self-reflection opportunities.

The third indicator of the learning element's differentiation level refers to the extent that it fosters *learning with others,* i.e. provision of opportunities to share experiences, feelings, perspectives with others, collaborate and negotiate perspectives, and work together in groups or pairs (Kalantzis and Cope, 2012; Mezirow, 1997; Tomlinson, 2001) . Thus, a learning element is categorized as a) *fostering learning with others* when it provides opportunities to learners to share experiences, feelings, perspectives with others, and/or collaborate and negotiate their different perspectives, and/or co-create, b) *fostering individual learning* only when it provides no opportunities to learners to share experiences, feelings, perspectives with others and/or collaborate and negotiate their different perspectives and/or co-create, and c) *developing learning with others* when it provides a singular social learning opportunity.

6.8. My personal reflections on being an insider researcher and teacher educator for this doctoral research in teacher professional development on DI

Step 1: Acknowledging who the researcher is in this study

A key strategy for insider researchers to address concerns around biases due to inherent subjectivity is to identify who they are (Fleming, 2018). This section begins with an acknowledgment of my background and personal history that shaped my position as an insider in this doctoral research. My history begins in a small Greek town, Ioannina, where I was born in 1978. My love for language, diversity and education determined the choice of my undergraduate studies in the Department of English Language and Literature, University of Athens, Greece. I have taught English as a foreign language for ten years in both private and public schools from primary to

senior high school grades. I must admit that despite my longing to go into the classroom, and give to my students one of their best possible learning experiences, I remember many hours of going by the book and giving lessons that I personally perceived to be boring and lacking any serious meaning for them, or going to the other end and giving lessons which were fun-based but again feeling totally unsatisfactory to me and my students. I remember me having an indistinct, unconscious but still haunting feeling of guilt. I felt responsible for wasting those children's time and not teaching them in any meaningful way, in a way that could make a difference to their development and learning. My personal vision for the creation of classes where all students could grow through learning was the main incentive for following in 2003 my MA studies in Special Education, Graduate School of Education, University of Bristol, UK. There the first solid foundation was set for understanding the wide range of students' different learning and emotional needs. Later in 2010, a Fulbright scholarship for a two-month professional development program at the George Mason University, Virginia, USA, played a decisive role in my decision for a doctoral level research on differentiated learning since my quest for how to effectively practice inclusive education was ongoing. It is where I came across the concept of differentiated instruction and I felt that this could be the answer I had been looking for meaningful, intrinsically motivating teaching and learning for all.

The main intent and motivation for my PhD research was to gain an in-depth understanding of the practice of differentiated instruction in the context of a teacher professional development program aiming to teach other teachers how to effectively implement differentiation in their own lesson plans and classrooms. Since then, differentiation has been a quite long and challenging journey, which often felt impossible to succeed due to its multiple levels and complexities having me go into unknown and still unexplored territories. But what mainly mattered to me was this inherent insatiable desire to understand for myself what the pathways to inclusive and differentiated classrooms were. At the beginning, the whole thing was a total chaos entailing much confusion and uncertainty with failure looming. But then I cannot describe in words the satisfaction I felt for managing to put some order into that chaos and make my own personal meaning out of this. I kept going because what was even

more satisfying and soothing was the thought that 'At least, I tried – and that feels much better than not having tried at all'. Thus, after two years of long and pure literature research, I was ready to design and implement EDIT. At the time of my doctoral study, I was working in the National Library of Greece as a seconded teacher doing mainly office work.

As part of my PhD research, I had no other choice but to become an insider researcher in the teacher professional development program that I had designed following the theoretical propositions of differentiated instruction and teacher professional development that resulted from the literature review part of this study. In reality, in the course of this research, my position as a PhD researcher of the study changed from an outsider status at the beginning of the research to gradually becoming an insider researcher since before the research I had no a priori knowledge of any of the participants while the online EDIT community of which I and the participants were all members was formed concurrently with the beginning of the research. Gradually, as the program and the community online relationships started to develop, I was moving along the continuum to become an insider researcher, i.e. given privileged access to the community as a researcher and to critical information about the program, shared the same experiences with the participants, developed a deeper understanding of the practice of DI in an online teacher professional development program and monitored the challenges and risks of my dual role as a teacher educator and a researcher.

Reflecting on the experience, one of my greatest worries as a teacher educator and researcher was how to set up a vibrant community where teachers would feel *safe* enough to share their vulnerable moments, explore unfamiliar territories, experiment in their classrooms, and, most importantly, stick with a long and demanding program because of their intrinsic motivation since their participation was wholly voluntary. At the same time, I was confident enough about the program's value due both to its content and its employment of differentiation principles. I was certain that my colleagues would find EDIT knowledge, insights and processes valuable. I had been in their shoes before when looking for answers to effective learning. Overall, the EDIT community became a vibrant community with wholly committed teachers.

Throughout the first three EDIT cycles, I felt that the program had managed to intrinsically motivate the great majority of teachers, who uploaded their work on time, actively participated in the community dialogues with their comments and, often, with questions to me personally via e-mail or in the Scholar platform. It was obvious that the ideas and the learning processes used in each of the first three cycles brought teachers across new learning and new insights over student diversity and their teaching habits, challenged their familiar ways of thinking, teaching practices and behaviors towards their students and involved them in processes of deep self-reflection and change. Teachers were obviously and particularly impacted by the potency of the ideas of the 2nd EDIT cycle, i.e. the idea that intelligence can change through learning and the new possibilities that this belief opens up for both students and them. In effect, teachers visited again and again the community posts of the 2nd cycle, kept referring to its ideas after the end of the cycle, had vibrant dialogues within the community, were excited to revisit their students through the lens of fixed and growth mindset, and they experienced their own success when implementing their own learning elements on these topics. Indeed, the feedback teachers gave to the community about their students' response to all their learning elements at the end of each cycle was rather positive observing a change in their students' behavior, active involvement, and enthusiasm while teachers themselves felt satisfied with their success.

On the other hand, teacher enthusiasm with the program started waning at the fourth and final EDIT cycle. I think that we were all tired by then. It was the final cycle of the program. We had all done too much work by then and the school year was reaching its end. In fact, the end of the cycle work coincided with the exam period at the end of the school year. In addition, the main work of the 4th cycle was organized in the form of a web-quest, where teachers were divided into two groups and were asked to do a jigsaw reading task about the LbD knowledge processes. Jigsaw reading is a differentiation strategy assigning to different members of a group different reading comprehension tasks to share their understanding with the rest of the group. The teachers were given all the necessary resources and material to read and watch so as to understand the nature of LbD processes, and, then, they had to draw the

connections of each knowledge process with Bloom's taxonomy and Kolb's experiential learning cycle processes. Each teacher was assigned to read the relevant resources and do a presentation to her group about *a pair* of the four main LbD processes, and, thus, teach the other members of the group about it. They were given a month to complete this task, which may have been too much work for a long period of time without whole CoP communication, connection and support. Possibly, a step by step work on LbD within the whole community, the way it was done in the previous cycles would have been a more appropriate choice.

An issue often arising due to the asynchronous nature of EDIT was the difficulty the teachers had to cooperate in an asynchronous manner. That became apparent from the first collaborative EDIT task towards the end of the 1st cycle where teachers had been asked to work in groups in order to co-write a paper. The biggest problems were due to the participants' difficulty in openly communicating their time restrictions with the rest of their group. As a result, most teachers actively contributed and co-operated on the task while some felt absent and consequently uncooperative. In essence, the problem with asynchronous online learning was that the teacher educator or the teachers could not know when others would respond, and when not responding promptly to their questions or comments what the reason was. This obliviousness resulted in feelings of insecurity, distress, and anger. I would often send an e-mail to a teacher who had been absent from the community for a while asking her as discreetly as possible what the reason was for her absence and suggesting to her to let the rest of the group know as well. Where appropriate, having in mind that I should be discreet not to interfere too much, I gently invited them into being more open to the others in the community so as to help them build a more trusting and secure online climate among them. For example, I suggested to D1 on October 24th, 2016, 7:07 PM after having informed me that she would be abroad for a week due to a conference presentation, '*What would you say about writing a few words about your conference presentation to the community or upload 1-2 photos from your professional trip – explaining that way as well your weekly absence from the community? I think everybody would be interested to hear about it. Have a nice trip for the time being and we will be waiting for you*.'

EDIT lasted for a year, actually lasting longer than was initially planned since it addressed the participant teacher needs for more flexible time limits whenever they found the tasks too demanding in connection to their heavy workload or tight schedules. Ideally, one more year would have been necessary so that the teachers would have the chance to more fully practice the implementation of DI principles in their classrooms and in parallel i) share their experiences with other teachers, ii) answer together questions that would arise in everyday practice, iii) be supported and motivated by others through the challenges of differentiation in real practice and iv) gradually implement DI more readily. To sum up, EDIT has been a tiring but a very creative and rewarding experience for me. Possibly exactly the way it has been for the participant teachers. Through the course of this experience I have gained deep and valuable understandings for what makes effective teacher professional development on DI, and what it takes to effectively implement DI in the classroom.

Step 2: Voluntary and diverse research participant recruitment

In EDIT research, the recruitment of the participants was free of any form of implicit or explicit coercion. According to Fleming (2018), the possibility of bias in the recruitment of the participants through the exertion of some form of implicit or explicit coercion from the researcher must be addressed where power relationships are involved. For research participant recruitment, I sent an invitation (see Appendix 1) via e-mail to the EFL teachers of the Athenian Model and Experimental High-Schools, which was accepted by a quarter of the recipients, i.e. five teachers. A sample of five teachers, though, was not considered enough for developing a community for research purposes. Thus, my supervisor asked an Athenian school advisor to send the invitation to a limited number of general high-school teachers under her supervision, which was accepted by six teachers. Thus, the recruitment process resulted in eleven participant teachers coming from different contexts and with diverse affective profiles. The teachers of the Model and Experimental high schools while talking about themselves and their students at the very first community meeting evoked self-confidence, serenity and feelings of satisfaction from their classes. Their biggest

expressed concern related to how they could offer more to their already well-performing students. On the other hand, the general high school teachers' descriptions were full of complaints referring to school issues such as small classrooms crowded with lots of students, lack of facilities, difficulties of multicultural classes, the level of noise in their classes. Characteristically, a teacher said that she bought a projector herself so as to give her students the lessons she wanted, while another one said that she felt her enthusiasm started waning while she was trying to set up a school library herself.

Step 3: Adopting a positivist approach within a context of tensions and challenges experienced due to role duality

Acting as the designer, teacher educator and PhD researcher of EDIT, and, thus, being heavily immersed in both the research and the program, it was deemed necessary to ascribe to the positivist approach of insider research. Insider research from a positivist standpoint is seen as an objective process where the researcher holds the role of a detached observer and involves the development of a theory before its testing through empirical evidence (Brannick & Coghlan, 2007). As it has already been discussed (see 6.3) the research design of EDIT case study includes both qualitative and quantitative features in the design, data collection and analysis stages of the research, while it begins with a set of theoretical propositions about teacher professional development on differentiated instruction, which the case study sets out to test if it is supported by the empirical evidence. What is more, insider researchers within the positivist paradigm are expected to separate themselves and keep the two roles as distinct as possible via adhering to methodological principles of distance and objectivity (Brannick and Coghlan, 2007). As a result, the two roles, i.e. teacher educator and insider researcher, were quite distinct throughout the program. When I uploaded material on the Scholar platform and communicated with the participant teachers, I was acting from the role of the teacher educator trying to cultivate a community culture of openness to diversity and growth mindset. I took on the researcher role when I distributed the three questionnaires at the beginning, the middle and the end of EDIT, and, then, at the end of the program when I analysed both

quantitative and qualitative data, and, then, interpreted and presented the research results more as an outsider rather than an insider.

As the teacher educator of the community, my aim was to minimize the differential power between me and the participant teachers acting more as a collaborative learner who contributed my own personal experiences and alternative perspectives in the community discourse so as to facilitate teachers arrive at a best consensual judgement (Mezirow, 1996). At the same time, though, when functioning as the researcher of EDIT in moments such as the distribution of the questionnaires, asking clarifying questions to the participants, or simply communicating with the teachers, I was aware of my different role and tried to stay impart and objective keeping the necessary distance at the same time so as not to be interfering too much with the community activity. For example, in the second and third questionnaire when I was already an insider researcher knowing that teachers might answer the questions about EDIT in a certain way so as to please me, I purposefully included the following statement at the beginning, *'Take into consideration that I do not hold any particular expectations regarding your answers. I'm deeply interested in the true nature of your experience. The more open and holistic your perspective, the more effective it will be for Exploring DI Together's future development'.* That was mainly the reason why I included a question explicitly asking them about what they considered to be the *negative* aspects of EDIT. I was generally very careful so as not to be manipulative into getting them to say positive things about the program. I am aware, though, that the participants may have been more comfortable to write sensitively critical comments to a questionnaire given by an outsider. On the other hand, it is also possible that due to the rapport and a level of trust and openness developed in the community they felt comfortable to share more sensitive opinions about the program. Another ethical decision I had to make was not to use as data the personal communication via emails that I had with the research participants since at those instances they were communicating with the teacher educator and not the researcher. The use of 'incidental' data constitutes an ethical dilemma according to Mercer (2007), which could be a breach of trust and an abuse of access to the community.

Acting as the designer, teacher educator and researcher of EDIT, one of the biggest challenges for me was trying to balance effectively among these different roles and tasks. In fact, designing and implementing EDIT almost in parallel due to time limitations for the program to begin was stressful and daunting at times. Designing for a weekly upload involved lots of hours of thinking, creating tasks, searching for the appropriate material, choosing the appropriate fonts and colors. Nevertheless, this was a very creative process. It was the first time that I translated theory into practice, watched my ideas take shape and experimented with concrete material. Quite often I would take some distance and re-read the material as if new to me in order to make any necessary adjustments to make them more meaningful and intrinsically motivating for the participants. I would set questions for me to answer such as 'Is this a proper Experiencing the Known activity? Why? How will teachers experience it?', 'Is this essential question relevant to teachers? How else could I frame it?', 'Is this an appropriate photo? How does it relate to the main concepts of the unit?', etc. In effect, this was a quite solitary work and I would often wish for some feedback from a knowledgeable peer had it been feasible.

On the other hand, taking into account the fact that I had no previous experience as a teacher educator or online teaching, one of the greatest challenges I had to face while implementing EDIT related to the asynchronous online nature of the program. First of all, I had to learn how the Scholar platform worked in order to be able to support teachers in any technical matter arising. Indeed, during the program I had to respond to a number of teacher e-mails asking me for technical support. For example, H2[4] wrote to me on November 3rd, 2016, at 7:07 PM : *'Maria, I actually tried to open the files in the right column this morning and there appeared a blank page with the word ''error'' on it. Now, I am trying to open the same files and sometimes I succeed in doing so, but sometimes I get the following message '' We're sorry, but something went*

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[4] For reasons of facilitating the data analysis procedures of the research, the teacher names have been coded into a letter of the alphabet and the number 1, standing for a Model and Experimental School teacher, and the number 2, standing for a General High School teacher.

wrong. We've been notified about this issue and we'll take a look at it shortly.[5]'' I hope the problem will be solved. Thank you for your help.

Goodnight.' My response to her request on the same day at 9:14 PM was: *'H2 I think I have figured it out. You've probably tried to open the files shown in the activity stream, which are blank. You can see the shared files in the <u>right</u> column 'Recent Activity' - below the heading 'Shares'. I think you will be able to open them from there. Just let me know'*

Due to the asynchronous nature of the program, my enthusiasm and my inexperience, I was there to respond and support teachers online almost around the clock having not set any time boundaries with respect to my communication with them. Even in the weekends, when teachers had more free time to participate, I would read through their answers and comments so as to respond, or intervene appropriately where necessary trying to cultivate with my responses a community climate of open communication, collaboration, openness to diversity and growth mindset. However, this implicit contract of an almost omnipresent type of teacher educator communication with the participants was quite tiring and stressful. I think that it is necessary for any teacher educator to set particular time communication zones even in asynchronous online learning so that participants know beforehand when to expect a response from him or her.

In reflection, neither of my roles was compromised during the research process. They were quite distinct temporally, while it is true that due to my practitioner overload as the designer and teacher educator I could not perform them effectively simultaneously either. Nevertheless, they complemented each other contributing mutually from a different standpoint to my development of deep understandings of DI for effective teacher professional development.

Step 4: The supervising committee as critical friends

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[5] The teacher used bold lettering.

According to Fleming (2018, p.318), during the research stage of data analysis and interpretation, a useful strategy to avoid biases due to the researcher's own preconceived ideas and 'the desire for positive outcomes' is 'the use of a 'critical friend' who can interrogate and challenge your assumptions'. As Fleming (2018) notes this danger is not unique to insider research but it is considered more likely to occur due to the researcher's closeness to the field. As a PhD researcher, I was able to minimize such biases through my supervisor's, the Assistant Professor Evdokia Karavas, regular and critical feedback, and, at the final stage, the supervising committee's, the Professor Maria Kalantzis' and the Assistant Professor's Evgenia Arvanitis' critical reading of the final version of the thesis. They held the role of 'critical friends' interrogating and challenging my assumptions where necessary seeing as new and unfamiliar from a more objective and distant status what I perceived as familiar, expected and in a less critical light.

The Assistant Professor Evdokia Karavas, who read on a regular basis the first drafts of this study, made valuable critical comments on the analysis and presentation of the findings, which were presented at times in an overly positive outlook. When I was not critical enough, she would read the draft chapters keeping the necessary distance. As a result, at times I had to revise the drafts and change the subjective phrasing and words. On the other hand, particularly the participant teachers' learning elements (see 9 chapter) were initially analysed and presented in a mainly black or white manner missing both the strengths of teachers' learning elements before EDIT and the after EDIT weaknesses. The end result was a biased version of teacher change missing what proved to be mainly teacher scaffolded learning during EDIT dependent on each teachers' different starting point and a more accurate picture of different teachers designs before and after the program.

The Assistant Professor Evgenia Arvanitis, who critically read one of the final drafts of this PhD manuscript, commented on the need to present the findings of this research in triangulation by converging under the same theme the quantitative and the qualitative results so as to increase the credibility and validity of the research. The initial structure of the chapters presenting the findings was different meaning that the

quantitative findings were presented in distinct chapters from the qualitative ones. Towards this direction, she also commented on the need to present the analysis data in a more meaningful way to the reader by grouping together the findings referring to the participant teachers' questionnaire answers and products before EDIT and the findings referring to teachers after EDIT.

In the same light, the Professor Maria Kalantzis' critical reading of the final version of the thesis also drew my attention to the dangers of not being objective enough so as to back up all my claims by evidence being explicit and exact, for example, about the numbers involved particularly in the discussion chapter (see 10 chapter), where I referred to the findings of the previous chapters descriptively by saying 'the majority' or 'few' of the participants without using any numbers or percentages. Thus, I had to revise the chapter and add next to the descriptions the exact numbers involved in the findings I was referring at. She also stressed out the need to be explicit about my insider role in the methodology chapter and explain the steps I had taken to limit insider bias. Finally, she made some necessary edits throughout the manuscript to my frequent use of adverbs such as 'in essence', 'interestingly' or 'indeed', which coloured the thesis' sentences with an implicit subjective overtone.

6.9. Conclusion

This chapter has attempted to explain the rationale behind the research design of this study. It started with the presentation of the three main research questions this study set out to explore, discussed the research design of an evaluative case study within an insider research context and the methods employed, i.e. survey and learning element analysis,. Each research instrument has been presented in detail along with the methods of descriptive statistics, qualitative and quantitative content analysis employed along the different sections of the three questionnaires and the teacher learning elements before and after EDIT.

In the chapters that follow, the findings from each kind of analysis are presented and discussed by presenting in triangulation the quantitative and qualitative results

answering consecutively the three research questions. As a result, chapter 7 answers the first research question and presents teachers' experience with EDIT, chapter 8 answers the second research question presenting the results of EDIT effectiveness in transforming teachers' educational frames of reference, and chapter 9 answers the third research question presenting the results of EDIT effectiveness in developing the teachers' ability to design high-quality differentiated learning elements.

Chapter 7
Teachers' Perceptions of their Experience with EDIT

7.1. Introduction

This chapter sets out to explore the answer to the 1st research question of the study, 'how did teachers perceive the experience of EDIT?' by presenting in triangulation the

results of a) the descriptive statistical analysis of the closed questions included in the first, the second and the third questionnaires distributed to the participant teachers at the beginning, in the middle and the end of the program respectively, and b) the qualitative and quantitative content analysis of the open-ended survey questions in the middle and the end of EDIT. The first part (7.2) presents the EDIT participant teachers' profile including demographics, their previous experience with TPD and DI, as well as teachers' DI related perceptions and practices before EDIT. The aim of this section is to draw an accurate picture of the case study 11 Greek EFL participant teachers, who volunteered to participate in EDIT so as to better understand the results of the analysis in connection to the profile of the participants.

The second part (7.3) presents the results of the descriptive statistical analysis of the section 'Rating *Exploring DI Together*' in the middle and the final questionnaires, which seek to further explore quantitatively the answer to the first research question asking how satisfied teachers felt with EDIT in a number of conditions and processes it attempted to employ. The third part (7.4) presents in the form of five themes the results of the qualitative and quantitative content analysis of the open-ended questions in the middle and final questionnaires exploring how teachers perceived their experience with EDIT. The aim of this section is to capture the essence of teachers' experience with EDIT. The final part (7.5) brings together the results of both the quantitative and the qualitative analysis of the previous sections so as to explore whether there is triangulation of the results, and, finally, explore whether EDIT has been successful in creating the necessary transformative, affective, meaningful and social conditions for teachers' effective TPD on DI, confirming, thus, the study's propositions, or not.

7.2. EDIT participant teachers' profile

This part presents the results of the descriptive statistical analysis of the closed-ended questions of the first questionnaire distributed to teachers at the beginning of EDIT. The aim of this part is to draw the case study teachers' profile including information such as their demographics, their previous experience with TPD and DI, as well as their DI related perceptions and practices at the beginning of the program.

7.2.1. Teacher demographics

The participant teachers of EDIT were an online community of 11 Greek secondary school highly qualified, experienced mainly middle-aged EFL teachers of medium level Information Technology proficiency with a high interest in their PD and no previous PD experience with DI. The basic demographic characteristics of the teachers are presented below in Table 7.1. In more detail, the EDIT CoP was made up of a mixture of almost equally divided General High School (N=6, 54.5%), and Experimental Model High School teachers (N=5, 45.5%), a mixture of teachers from quite diverse educational contexts and diverse professional development needs with respect to DI taking into account that Greek Model Experimental Schools play a special role within the Greek educational system as one of advancing educational research, applying innovative educational practices and supporting both gifted students and students with special educational needs (Ch. C, article 36, FEK 118 -2011, L. 3966/2011). The majority of teachers (N=7, 63.6%) were 41-50 years old while the rest were divided between the younger 18.2% (N=2) of the sample, who were 31-40 years old, and the older 18.2% (N=2), who were >=51 years old.

Regarding the participant teachers' qualifications, the great majority N=9 (81.8%) had a master's degree, while the rest were equally divided between holding two first degrees N=2(18.2%), having a second master's degree N=2(18.2%) and having a PhD N=2(18.2%). The majority of teachers had been teaching English as a Foreign Language in the Greek public school for 11-15 years (N=6, 54.5%) followed by those

Table 7.1. Demographic characteristics of the participants

	N	%
Type of school		
Experimental High School	5	45.5
General High School	6	54.5
Age		
31-40	2	18.2
41-50	7	63.6
>=51	2	18.2
Educational Background		
First degree	11	100
Second First degree	2	18.2
Master	9	81.8
Second Master	2	18.2
PhD	2	18.2
I have been teaching English as a Foreign Language in the Greek public school for		
6-10 years	1	9.1
11-15 years	6	54.5
>=16 years	4	36.4
My level of proficiency in Information Technology is		
Low	0	0
Medium	8	72.7
Advanced	3	27.3

who had been teaching English for >=16 years (N=4, 36.4%), while the great majority (N=8, 72.7%) identified themselves as having medium level proficiency in Information Technology followed by those who were of an advanced level (N=3, 27.3%).

7.2.2. Teachers previous experience with TPD and DI before EDIT

This section presents the results of the statistical analysis of questions 7 to 10 (Part A) of the first questionnaire attempting to draw the participant teachers' profile with respect to their previous professional development (PD) experiences generally and in relation to DI before EDIT. The information drawn from the statistical analysis is complemented by a paragraph with the results of qualitative content analysis of teachers' responses to the 7.b open-ended question asking them to describe the type,

duration and topic areas covered in some of the professional development programs that they considered to have contributed greatly to their growth as professionals.

The vast majority of the participants were quite interested in their PD taking part in professional development programs (N=10, 90.9%) more than once per year (N=6, 66.7%), followed by those who participated in professional development programs once every 2 years (N=2, 22.2%) (see Table 7.2). The qualitative content analysis has shown that regarding the type of TPD experiences they had in the past, the majority (N=5, 46%) referred to seminars, a few (N=3, 27%) referred to courses, a few others (N=2, 18%) referred to workshops, one teacher referred to an e-community

	N	%
I have participated in a professional development program before		
Yes	10	90,9
No	1	9,1
How often you participate in professional development programs of any kind, i.e. seminars, workshops, communities of practice, mentoring, specialists' talks		
More than once per year	6	66,7
Once per year	1	11,1
Every 2 years	2	22,2
Once every 3 to 4 years	0	0
Never	0	0
Have you been trained in differentiated instruction before?		
Yes	0	0
No	5	45,5
No answer	6	54,5
Have you participated in a Community of Practice before?		
Yes	2	18,1
No	3	27,2
No answer	6	54,5

Table 7.2. Results for questions measuring teachers' previous professional development experiences

experience and another one to a PD experience of working as an assistant teacher in a Belgian school. Teachers' responses of the duration of these PD experiences were divided from one to two months (N=4, 36%) and one to two days (N=4, 36%). The rest (N=2, 18%) mentioned that their PD experiences lasted for over two months, i.e. from 6 months to 400 hours, or (N=1, 10%) two weeks.

The most popular area of PD that the majority of teachers (N=6, 55%) referred to was Information Technology such as Moodle, followed by a quarter of the teachers (N=4, 36%), who attended some psychology and dyslexia seminars. A few teachers (N=3, 27%) referred to general teacher PD experiences such as the Great National Teacher Training Program (Μείζων Επιμόρφωση), which began in the context of the New School reform and attempted to develop professionally 150.000 Greek teachers of both primary and secondary education using sound principles of adult education with the aim to respond to both teachers' and learners' different needs (Karagianni, 2018). Finally, a few teachers (N=2, 18%) referred to seminars on the area of class management and conflict resolution, while a few others (N=2, 18%) referred to a literature and an applied linguistics TPD experience.

With respect to DI, half teachers, (N=6, 54,5%) did not answer the question about their previous training in DI. All teachers (N=5, 46%), who answered, reported that they had not been trained in DI before. Similarly, half teachers, (N=6, 54,5%) did not answer the question about their previous participation in a CoP. From those who answered, only a few, N=2 (18,1%) had participated in a Community of Practice before EDIT. Possibly, these two questions were overlooked by some of the teaches due to their location in the questionnaire, following in the form of sub-questions the open-ended question asking teachers to describe in some detail the type of previous PD programs they had. From a follow-up question, it occurred that only a few teachers (N=2, 18.2%) felt adequately trained in following DI principles in their classrooms.

With respect to teachers not feeling adequately trained in DI, the reasons for not feeling so are presented in Table 7.3. Specifically, the majority of the participants considered the reasons to be lack of opportunities to participate in professional development programs (N=5, 55.6%) and the overt theoretical nature of professional development programs with no focus on practice (N=5, 55.6%) followed by lack opportunities to work and discuss with colleagues (N= 4, 44,4%). Teachers' responses appear to express a general criticism of TPD programs, their

	N	%

I feel adequately trained in following differentiated instruction principles in my classrooms.	*Yes*	2	18,2
No		9	81,8
If no, could you identify the reason(s) why not?			
Lack of opportunities to participate in professional development programs	*Yes*	5	55.6
	No	4	44.4
Short duration of the professional development programs	*Yes*	1	11.1
	No	8	88.9
The overtly theoretical nature of the professional development programs with no focus on practice	*Yes*	5	55.6
	No	4	44.4
Lack of opportunities to discuss and work with other colleagues	*Yes*	4	44.4
	No	5	55.6
Other	*Yes*	2	22.2
	No	7	77.8
I have read at least once the Integrated Foreign Languages Curriculum	*Yes*	10	90.9
	No	1	9.1
I feel well familiarized with the Integrated Foreign Languages Curriculum	*Yes*	4	36.4
	No	7	63.6

Table 7.3.Results for questions measuring teacher knowledge in differentiated teaching

need for teacher professional development on DI with a focus on practice and opportunities given to work and discuss with colleagues. Finally, the great majority N=10 (90.9%) answered that they had read at least once the Integrated Foreign Languages Curriculum, while N=7 (63.6%) of the participants claimed that they were not familiarized with it underlying their lack of understanding of the principles of DI and the LbD knowledge processes, which is a suggested way of differentiated lesson designs in the new Greek curriculum for foreign languages.

7.2.3. Teachers' DI related perceptions and practices before EDIT

This section presents the results of the statistical and content analysis of questions 1 to 6 (Part B) and questions 1 to 23 (part E) of the first questionnaire before EDIT so as to draw the profile of the participant teachers' DI related perceptions and practices before EDIT. In particular, questions 1 to 6 (Part B) explored quantitatively teachers' perceptions of their class homogeneity, DI, the school textbook and needs analysis practices. The picture drawn from the results of the statistical analysis is complemented by the results of content analysis of two open-ended survey questions about student diversity in teachers' classes and how and/or what they differentiate after their affirmative answer to implementing DI.

As Table 7.4 shows the great majority of the teachers claimed that their classes were not homogeneous (N=8, 72.7%). In response to question 2, 'How important do you think differentiated instruction is for effective learning?', the majority of teachers (N=8, 72.8%) reported that they believed that DI is extremely important/very important for effective learning, while, interestingly, in response to question 3 'Do you differentiate?', the great majority (N=9, 81,8%) reported that they differentiated before EDIT despite the absence of any formal training in DI. With respect to learner needs analysis, all teachers (N=11, 100%) claimed that they carry out a needs analysis in order to draw a profile of their students' needs mainly through the observation and tests, which the majority of teachers (N=7, 63.6%) reported using while avoiding any open communication with other colleagues (N=3, 27,3%), the students i.e. in the form of an interview (N=1, 9,1%), or their parents (N=0, 0%). The focus of the teachers' needs analysis is mainly on their students' level of English (N= 9, 90 %) and their interests (N=8, 80%) following a focus on students' multiple intelligences (N=5, 50%) and learning styles (N=4, 40%).

Finally, as regards question 5 'How useful are the school textbooks in helping you differentiate your instruction?' most teachers responded 'Slightly useful' (N=5, 45.5%) followed by those who responded 'Moderately useful' (N=4, 36.4%) with all teachers (N=11, 100%) claiming that the textbooks are rather limited in content. What these results show is that teachers before EDIT were already aware of student diversity with

an emphasis on their students' different language levels while they not only valued DI but they also implemented it within a school context where the resources at their availability, i.e. the school textbook was slightly useful due to its limited content.

With respect to the participant teachers' perceptions of learner diversity before EDIT, the results of content analysis have shown that half of teachers (N=5, 46 %.) focused solely on language competence differences between their learners. For instance, H2 wrote that her learners differed with respect to their '*vocabulary, grammar, writing, speaking*'. A few (N=2, 18%) referred solely to differences in terms of learners' family

		N	%
1. My classes are homogeneous	*Yes*	3	27.3
	No	8	72.7
2. How important do you think differentiated instruction is for effective learning?	*Extremely important*	4	36.4
	Very important	4	36.4
	Important	1	9.1
	Somewhat important	2	18.2
	Not important at all	0	0.0
3. Do you differentiate?	*Yes*	9	81.8
	No	2	18.2
4. Do you carry out a needs analysis for your classes in order to help you draw a profile of your students' needs?	Yes	11	100.0
	No	0	0.0
4.a. If yes, through what means do you carry out a needs analysis?			
A questionnaire	Yes	2	18.2
	No	9	81.8
Observation	Yes	7	**63.6**
	No	4	36.4
Parents	Yes	0	0
	No	11	100.0
A test	Yes	7	**63.6**
	No	4	36.4
Student interview	Yes	1	9.1
	No	10	90.9
Information from other teachers, principals, etc	Yes	3	27.3
	No	8	72.7
Other	Yes	0	0
	No	11	100.0

4.b. What is the focus of your needs analysis?

Level of English	Yes	9	81.8
	No	2	18.2
Interests	Yes	8	72.7
	No	3	27.3
Multiple intelligences	Yes	5	45.5
	No	6	54.5
Learning styles	Yes	4	36.4
	No	7	63.6
Other	Yes	1	10.0
	No	10	90.0

5. How useful are the school textbooks in helping you differentiate your instruction?	Extremely useful	0	0
	Very useful	0	0
	Moderately useful	4	36.4
	Slightly useful	5	45.5
	Not at all useful	2	18.2

6. Which one of the following statements better describes the reason for your answer in question 5 above?

They are rather limited in content but I do not have the time to prepare my own materials / resources	Yes	0	0
	No	11	100.0
They are rather limited in content. That is why I enrich my lessons with my own material / resources	**Yes**	**11**	**100.0**
	No	0	0
They are very useful and facilitative in my teaching. I use them the way they are	Yes	0	0
	No	11	100.0
I do not use them and I prefer to give students my own material / resources	*Yes*	**1**	**9.1**
	No	10	90.9

Table 7.4. Results for questions that measure teachers' DI related perceptions and practices before their participation in the programme

and cultural background. For example, E1 wrote '*(i)n some of my classes, the students differ significantly as to their family backgrounds, something that – to a certain degree – affects their aspirations and dreams for the future'*. One teacher (N=1, 10%) perceived differences in their ways of learning such as intelligences and learning styles, while one teacher (N=1, 10%) referred to students' interest for learning English as a foreign language. In essence, these qualitative results triangulate the statistical analysis results above revealing teachers' relevant awareness of student diversity with a greater focus on language level differences.

The results of 3a question asking teachers 'Could you please specify how and/or what do you differentiate?' showed that before EDIT the majority of teachers' DI practices (7 teachers, 64% in 14 meaning units) represented practices of the linear transmissive teaching tradition in schools such as a) giving students different tasks (3 teachers, 27%), b) using various teaching methods and tools (2 teachers, 19%), c) varying the material (2 teachers, 19%), d) teacher asking different questions to advanced and struggling students (2 teachers, 19%), e) giving different instructions (1 teachers, 10%), f) varying the length of time (1 teachers, 10%) , g) using both languages, English and Greek (1 teachers, 10%).

In other words, they are practices with an external focus on what the teacher does, not what or how the learners learn, where teachers assume no responsibility for the creation of appropriate learning conditions and processes for learners to learn, underlain by the assumption that teaching equals teacher telling, asking questions to students, giving tasks, using materials and methods for students to learn effectively. Even the rationale of a few teachers' account (3 teachers, 27%) for not differentiating reveals their external focus to environmental conditions such as time, the number of students, noise, or absence of classroom equipment, for their not assuming any responsibility for learners' learning. For example, H2 listed the following reasons for not differentiating: 'short period of time, number of students, poorly-equipped classrooms, noise'. Only a few teacher practices (2 teachers, 19% in 3 meaning units) before EDIT focused on humanistic teaching learning processes, which are in line with DI, such as learner grouping and collaboration.

Questions 1 to 23 (part E) of the first questionnaire asked teachers to state how often they used a number of DI practices per month on a five-point Likert scale (1= *never*, 2= *1 to 2 times per month*, 3 = *3 to 5 times per month*, 4= *6 to 7 times per month*, 5= *always*) with the aim of drawing a profile of their teaching practices before EDIT. The statistical analysis showed the mean measures of teachers' central tendency towards some DI practices rather than others (see Table 7.5).

In particular, among the participants' most popular responses (from mean= 4.64 to mean= 4.00) were their choice of statements such as 'I take deliberate efforts to ensure each student feels known, welcome, and respected' (mean=4.64), or, 'I strive to maximize the potential of all students' (mean=4.00). Following in popularity (from mean=3.91 to mean=3.00) were more concrete teaching practices, which relate mainly to teachers' use of a variety of modalities and learning processes, student understanding of content, planning in advance, provision of extra material and choices to students. For example, teachers chose that most frequently 'I use materials in a variety of formats (text, video, audio, web-based)' (mean=3.91), or, 'I present course content using visual displays or demonstrations' (mean=3.73). The statistical analysis also showed teachers' paying greater attention to struggling student needs rather than advanced student needs since they most often provide extra materials to support students who have difficulty understanding course content (mean=3.55) rather than to challenge students who master course content with minimal effort (mean=3.09). The least frequent teaching practices (from mean=2.91 to mean=1.82) were practices that related to purposefully grouping students based on their preferred ways of practices before their participation in the program

	Mean	Std. Deviation	Min	Max
I take deliberate efforts to ensure each student feels known, welcome, and respected	4.64	1.206	1	5
I strive to maximize the potential of all students	4.00	1.183	2	5
I adjust assignment deadlines in response to individual students' needs and / or circumstances	4.00	1.183	2	5
I take special care to create the conditions for students to feel challenged with respect to the taught content, i.e. with tasks that are neither too easy nor too difficult	4.00	1.095	2	5
I use materials in a variety of formats (text, video, audio, web-based)	3.91	1.044	2	5
I set aims of my students understanding in depth the course content	3.80	1.135	2	5
I plan in advance different approaches to teaching course content	3.73	.786	3	5
I create activities that involve the learner in a variety of learning processes (e.g. feeling, reflecting on previous experience, thinking, acting)	3.73	1.348	2	5
I use text and / or other materials that present course content in a variety of ways (e.g. narrative & graphic)	3.73	1.191	1	5

I present course content using visual displays or demonstrations	3.73	1.104	1	5
I use a variety of grouping formats during class (e.g. whole class, small group, individual)	3.73	1.191	2	5
I provide extra materials to support students who have difficulty understanding course content	3.55	1.214	2	5
I offer several different choices to learning maximizing the chances that all students will find that way an appropriate fit to their different needs	3.36	1.120	2	5
I identify what is the students' previous knowledge of the subject matter and then I offer tasks that are a good match to their different levels	3.18	1.328	2	5
I provide extra materials to challenge students who master course content with minimal effort	3.09	1.700	1	5
I take special care to create the conditions for students to feel autonomous and self-regulated (e.g. plan their own learning, monitor the learning process and evaluate its results)	3.09	1.300	1	5
I create more advanced level activities for students who master course content with minimal effort	3.00	1.183	1	5
I provide extra material to support students who have difficulty completing activities	3.00	1.414	1	5
I create activities that allow each student to select a topic of personal interest.	2.91	1.300	1	5
I create activities that offer different choices (e.g. write a paper, create a visual, design a web page, or give a presentation)	2.70	1.252	1	5
I purposefully group students based on their language levels (e.g relevant background knowledge, language skills)	2.45	1.635	1	5
I purposefully group students based on their interests	2.18	1.168	1	5
I purposefully group students based on their preferred ways of learning	1.82	0.982	1	4

Table 7.5. Results for questions that measure how often teachers perform some DI

learning (mean=1.82), their interests (mean=2.18) or their language levels (mean=2.45) and offering student choices taking into account their different learning preferences (mean=2.70) and interests (mean=2.91).

7.3. Teacher satisfaction with EDIT

This section presents the descriptive statistical analysis of the section 'Rating *Exploring DI Together*' in the middle and the final questionnaires, which seek to further explore the answer to the first research question asking how teachers perceived the experience

of EDIT. In the middle questionnaire, the participant teachers answered twenty-five Likert-type questions asking them to rate their degree of satisfaction in a number of statements on a scale of 1 (minimum) to 10 (maximum). In the scale, an assessment from 8.01 to 10 stands for 'Extremely satisfactory', from 7.01 to 8 for 'Very satisfactory', from 6.01 to 7 for 'More than satisfactory', from 5.01 to 6 for 'Satisfactory', from 4.01 to 5 for 'Moderately satisfactory', from 3.01 to 4 for 'Slightly satisfactory' and from 1 to 3 for 'Not satisfactory at all'. In the final questionnaire, the teachers were asked to answer a shorter version of the previous set of questions with only fourteen core questions since the final questionnaire was a larger at length questionnaire combining both the previous two questionnaires, and it had to be kept at a user-friendly length. Overall, teachers appeared very satisfied with EDIT. It is characteristic that to the question 'My overall experience of EDIT' the central teacher tendency was at the top of the scale with a mean=8 (very satisfactory) in the middle of EDIT and mean=8.27 (extremely satisfactory) at the end. Table 7.6 presents the way teachers rated EDIT in the middle and the end of the program.

In the middle of EDIT teachers were, a) *extremely satisfied* with how EDIT addressed their interests (mean=8.45) and the way it challenged them (mean=8.45), the access it provided to documents or sources of information (mean=8.45), its meaningfulness, i.e. the way it drew connections to their previous knowledge (mean=8.36), the development of their self-reflection (mean=8.36), b) *very satisfied* with, for example, how it provided access to tools, methods or processes (mean=8.00), the way it addressed essential knowledge (mean=8.00), the way it changed their understanding of their students' different needs (mean=8.00), the way it addressed their learning preferences, i.e. learning styles (mean=7.91), its relevancy to their professional needs (mean=7.91), how autonomous and self-regulated they felt (mean=7.91), c) the aspects of EDIT that satisfied teachers the least, but still remaining *more than satisfied*, related mainly to the social part of EDIT, such as their sense of belonging to the community (mean=6.45), the interaction with others (mean=6.55) or the level of trust felt within the community (mean=6.73).

211

After EDIT, teachers appeared a) the most satisfied, i.e. *extremely satisfied*, with the transformative nature of EDIT, i.e. the way it changed their understanding of their students' different needs (mean=8.55), the development of self-reflection (mean=8.36), the way it has been relevant to their professional needs (mean=8.55) and the way it addressed essential knowledge (mean=8.36). The challenging nature of EDIT, an intrinsic motivation indicator, rated high at the end of EDIT as well (mean=8.27), b) *very satisfied* with their learning and development (mean=8.00), the way it addressed their interests (7.91), EDIT's social aspects such as their sense of belonging to the group (mean=7.45) and the way they learnt from their colleagues (mean=7.45), c) the participants appeared the least satisfied, i.e. at the *satisfied* band, with the way EDIT balanced theory and practice (mean=6.73) and their interaction with others (mean=6.91).

It is interesting to note the changes that appeared in teacher ratings at the end of EDIT in comparison to their respective ratings in the middle of the program. Some values increased and some decreased after EDIT except teacher rating of the way EDIT developed their self-reflection which remained stable (mean=8.36). After EDIT, the value of EDIT that showed the greatest increase in its rating by teachers was teachers sense of belonging to the group (mean=6.45 vs mean=7.45) indicating that the development of teachers' sense of belonging to a community develops gradually over time. Second in order was teacher rating of EDIT relevance to their professional needs (mean=7.91 vs mean=8.55) indicating that EDIT with all its four LbD cycles was most effective in addressing Greek professional teacher needs. Third in order was teacher evaluation of their changed understanding of their students' different needs

	In the middle of EDIT				At the end of EDIT			
	Mean	Std. Deviation	Min	Max	Mean	Std. Deviation	Min	Max
The way it addresses my interests	8.45	1.128	6	10	7.91	2.023	3	10
The way it challenges me	8.45	1.214	6	10	8.27	1.618	5	10
Having access to documents or sources of information I would not have otherwise	8.45	1.572	6	10				
The way it draws connections to my previous knowledge	8.36	1.206	6	10				
The development of self-reflection	8.36	.924	7	10	8.36	1.362	6	10
The way it addresses essential knowledge	8.00	1.183	6	9	8.36	1.027	6	10
Having access to new tools, methods, or processes	8.00	1.414	5	10				
The way it changed my understanding of my students' different needs	8.00	1.612	5	10	8.55	1.572	5	10
My overall experience of Exploring DI Together	8.00	1.414	5	10	8.27	1.737	4	10
The way it addresses my learning preferences, i.e. my learning style	7.91	1.700	5	10	7.64	1.859	4	10
The way it has been relevant to my professional needs	7.91	1.446	5	10	8.55	1.916	4	10
How autonomous and self-regulated I feel	7.91	1.044	6	9				
The way I feel more inspired by the work I do	7.91	1.136	6	10				
The way it is meaningful to me	7.90	1.853	4	9				
My learning and development	7.82	1.079	6	9	8.00	1.414	5	10
How intrinsically motivated I feel	7.64	1.206	5	9				
The way it balances theory and practice	7.27	2.195	3	10	6.73	1.954	3	9
The way I have reached deep understandings	7.18	1.601	5	9				
How competent and efficacious I feel	7.18	0.982	5	8				
The way it is practice-focused	7.18	2.183	2	9				
The way I learn from my colleagues	7.18	2.040	2	9	7.45	1.368	5	9

The way I feel less isolated	6.91	1.514	4	9				
The way I trust others within the community feeling that I can turn to them for help	6.73	2.102	2	9	7.09	1.640	4	9
My interaction with others	6.55	1.214	5	9	6.91	1.514	5	9
My sense of belonging to the group	6.45	1.968	2	9	7.45	1.214	5	9

Table 7.6. Results for questions that depict teachers' rating in the middle and after EDIT

(mean=8.00 vs mean=8.55), which increased at the end of EDIT indicating that not only the first two LbD cycles which attempted to increase teacher awareness on different student needs, but also the last two LbD cycles, which helped teachers' understand how to design a high-quality differentiated curriculum, contributed positively in teacher increased understanding of student diversity. Another possible explanation for this increase is that teacher understanding grew over time through their experience with and observation of students after their raised awareness over their diversity. Apart from teachers' increased sense of belonging after EDIT, the rest of EDIT ratings of its social aspects also increased followed by teacher evaluation of EDIT content, i.e. the way it addressed essential knowledge (mean=8.00 vs mean=8.36) and their overall learning and development (mean=7.82 vs mean=8.00).

On the other hand, the aspects of EDIT, whose evaluation in terms of teacher satisfaction decreased after EDIT related mainly to the way EDIT addressed teacher different interests and learning preferences. In particular, the teachers' satisfaction with the way EDIT addressed their interests decreased from mean=8.45 to mean=7.91 after EDIT, while the way it addressed their learning preferences, i.e. their learning styles decreased from mean=7.91 to 7.64 after EDIT probably due to the most 'didactic', or else, the less open-ended nature of the second half of EDIT where teachers dealt with particular principles of high-quality differentiated learning element design rather than their lifeworld experiences like their students and self as in the first half of the program. This fact may have also led to the decrease in teacher satisfaction with the balance between theory and practice in EDIT (mean=7.27 vs mean=6.73).

7.4. Five emergent themes: the essence of teachers' experience with EDIT

This section presents the results of the of the open-ended survey questions in the middle and the end of EDIT answering the 1st research question of the study, 'How did teachers perceive the experience of EDIT?'. The methodology used is qualitative and quantitative content analysis. The emergent categories of the qualitative analysis were further categorized into the following five main themes, which manage to capture the essence of teachers' experience with EDIT. The themes, which are the focus of this section, describe EDIT as: a) a transformative programme, b) intrinsically motivating, c) with a high intellectual quality curriculum, d) a developing online asynchronous community, and e) with frustrating time aspects. The presentation of the themes is accompanied by the results of the quantitative content analysis measuring the number of teachers who perceived and referred to any of the emergent EDIT qualities and the intensity of occurrence of each EDIT quality giving a more complete picture of EDIT impact on teachers and its success in implementing DI for TPD on DI. Overall, teachers' experience with EDIT was a positive one. A total of 233 meaning units (86,9%) refer to teachers' perceptions of EDIT positive attributes and a total of 58 meaning units (21,6%) refer to teachers' perceptions of EDIT negative attributes.

7.4.1. A transformative program

The categories of the analysis describe EDIT as i) a springboard for constant reflection, ii) an innovative experience of DI, and ii) reported teacher change building up a picture of an inherently transformative program. As a matter of fact, the third most intensively described EDIT quality (with 25 meaning units – 9,3% out of the total 268 meaning units) is EDIT as a springboard for constant reflection and teacher becoming more open to diversity, while the fourth most intensively described EDIT quality (with 21 meaning units – 7,8% out of the total 268 meaning units) is EDIT perceived as a very innovative experience.

In more detail, EDIT is described by the majority of teachers (7 teachers- 64%) as a springboard for constant reflection making an explicit reference to their involvement in a) processes of self-reflection, b) reflection on teaching practice, c) reflection on teaching and learning stereotypes, and d) reflection on the relation between teachers and students. Characteristically, C1 commented *'I think if you have deeply got into it there's no way back. It's a springboard for constant reflection on the relation between teachers and students'*. In the same line, G2 focusing on self-reflection wrote that *'(e)xploring whether or not I possess a fixed mindset was enlightening'*, and F2 about teaching practice, *'(t)urning my PC on and seek for follow-ups in the professional chat gives me an incentive to keep thinking of my teaching practices'*.

The majority of teachers (7 teachers, 64%) described both EDIT content, and material as influential, creative and provocative of teacher reflection shedding light to previously hidden from consciousness content, and essentially raising teacher awareness. The vast majority of teachers (10 teachers, 91%) identified as influential material the content and the ideas of the 2nd LbD cycle referring to the concepts of a growth and fixed mindset. For example, F2 wrote *'[…] (m)ainly the discussion on the students' behavior and the concept of shame have drawn my attention. These are issues I have always wondered about and read about. I cannot teach or work without thinking of the human nature and the social parameters involved'*. A few teachers (3 teachers, 27%) wrote about the content of the 1st LbD cycle, the dangers of single stories. For example, D1 referred as influential to *'[…]the Oscar-winning short film "The Lunch Date" and Chimamanda Ngozi Adichie's talk "The Danger of a Single Story'*.

EDIT is also described as an innovative experience unlike anything else and away from the mainstream. This newness relates to transformative learning in the sense that teachers experience the new learning paradigm and are introduced to its new content, an essential condition for transformative learning. Indeed, the analysis has shown that teachers experienced as new both their differentiation experience and their own DI implementation experiences in their classrooms with their students. More specifically, teachers referred to the novelty of EDIT content (4 teachers, 36%,) the creativity of EDIT tasks (6 teachers, 55%) making a special mention to the Ted talks they watched.

For example, teachers used in their descriptions of EDIT tasks adjectives such as *'creative'* (e.g. C1), *'imaginative'* (G2), *'(o)ff-Broadway, innovative, diverse' (*F2) and *'fun'* (B1, E1). Mellou (1994) in her article 'Creativity: The transformation condition' sees creativity as creating the conditions for transformation since creativity involves transformations of what is already known enabling the creator to *see the familiar in a new light* free from fixedness and with an openness to new possibilities. 'Creativity involves a new growth, a new transformation of what people know and transformations can take several imaginative forms. For example, people might come to new conclusions about things by placing them in new relationships, as young children do during their play' (Mellou, 1994; p.87).

Half of teachers (6 teachers, 55%) talked about their DI experiences with *EDIT* as well as their own experiences of applying DI in their classrooms and the success they experienced with their students after applying their own DI learning elements. For example, C1 referring to the experiences of EDIT she would describe as new wrote *'(t)he course as a whole with everything we've covered so far with all the stages, activities, materials etc. (Learning element design is not new, but designing lessons that help students reflect on learning, the human mind etc, is sth new)'*, while G2 wrote: *'(s)peaking to my students about neurons and fixed and growth mindsets was something new, something that we both enjoyed but also something that made me reconsider my attitude towards students. I realized that sometimes I classified my students into categories just because they shared some characteristics with students I had in the past. Now I'm aware of that and try to see behind appearances'*.

Most importantly, though, the transformative processes teachers went through in EDIT have resulted in important teacher change according to teachers' own reports. In particular, EDIT has managed to:

 a) *turn their attention to students,* better understand them and become more open to student diversity according to the majority of teachers (7 teachers, 64%). For example, G2 wrote *'…I was also made to see that I have not always been fair in judging my students. I judged them on the basis of previous knowledge I had*

217

acquired from previous students. I didn't spend enough time to get to know each one of them and listen to their needs'.

b) *turn their attention to themselves as teachers* and reframe their self-perceptions resulting in more holistic changes in their professional development, according to a quarter of teachers (4 teachers, 36%). For example, E1 described very vividly the experience of having moments of epiphany and change as a teacher in her classroom: *'I am not sure I can talk about significant events', as such. I would rather describe them as 'moments of epiphany', that is, moments that something I had read in the programme suddenly gave me a new perspective in class. Because of the time that has passed, I am not sure I can recall particular examples – unless I check the relevant material again – but I still remember that feeling: being ready to react to a student's particular comment, then making a connection with something I had recently read, then pausing to process it for a while. There were several instances during cycles 1&2 that I left the classroom either wondering (about something I was previously sure about), or having come up with a completely different solution or approach than the one I would have normally had.'*

c) *change their relationship with some of their students or whole classes,* according to a quarter of teachers (*3 teachers, 27%).* For example, H2 wrote '*(t)he 1st grade student in the wheelchair (I've sent you a detailed email about that event)*' (see footnote for the email text) [6].

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[6] The email sent to the teacher educator on Dec, 12, 2016, 12:25PM, 'Good morning, Maria. In order to be more descriptive, as you asked, let me tell you the whole story. It has to do with one of the disabled students of the school. To be more specific, he needs a wheelchair, he can't move his hands, legs and turn his head. He is a new student, so I practically knew nothing about him, apart from the fact that he is not going to live long due to his health problems (as our principal informed us). Moreover, during our first lessons together he refused to be removed so as to watch the videos I was ready to project as part of our Grammar lesson. I was really embarrassed when I saw the whole class participate apart from him. The impression that I got was that he didn't like to be ''disturbed'', so I stopped ''bothering'' him. To be honest, I could neither live with that nor ask him open and freely (as Epley suggested) but I could ask his mother instead. I shared my thoughts with her and she totally agreed with me. The kid

d) *reframe their teaching practice,* according to a few teachers (2 teachers, 18%). For example, F2 wrote '*I will definitely suggest teachers to get involved in such a platform because it provides support and food for thought. It functions as an incentive to renew yourself, your methods and to experiment*'.

As a result, and in accordance to its transformative nature all teachers (11 teachers, 100%) would recommend EDIT. A quarter used strongly affirmative and positive evaluative language using adverbs like '*definitely'* or '*strongly recommend*'. A quarter since they perceived EDIT as time demanding. I2 said *'….. I would* recommend it on certain conditions. The first condition was that they found it appropriate only for used the plain affirmative '*yes'*, while a few teachers said that they would interested and reflective teachers. The second condition referred to teachers' time availability *recommend it to teachers who like reflection and theories and have the time, willingness and patience to work on themselves and understand their own beliefs and their students', but I wouldn't recommend it to teachers who want practical solutions to their problems or who are looking for techniques on how to differentiate their lessons'.* In essence, I2's answer perceiving EDIT as inappropriate for teachers who are looking for DI strategies and techniques is in coherence with teachers' perceptions of EDIT as a mainly transformative program.

The reasons that all teachers would either strongly or on certain conditions recommend EDIT pertain to its transformative nature. As a matter fact, D1 wrote '*…. it is a professional development program that is concerned with generating change with regard to the more complex constituents of teaching, i.e. awareness and attitude'*,

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himself wanted to be part of the class as all the students and now I can ask him whenever I want and sometimes the lady who accompanies him in class raises her hand to make his presence obvious and help me as well. Now he gets out of the class during the breaks (something that he never did) and he actually smiles. Conclusion: The simplified stereotype that I had for some time led me to misunderstandings and served as an obstacle as far as our communication was concerned. By asking, I removed that barrier and changed my behaviour towards him. The result is amazing for both of us!

and C1 '…. *It's really worth the effort. It opens a new window to the world of teaching and I think it's something really missing from the Greek education context. It makes teaching more meaningful and helps you perceive your role as a teacher who doesn't just teach "English", but also "people".*

7.4.2. An intrinsically motivating program

The analysis showed that teachers perceived EDIT as an intrinsically motivating programme. This feeling of inherent enjoyment and involvement with the program has emerged throughout the analysis along teachers' evaluation of EDIT content and tasks indicating the satisfaction of their basic affective needs of feeling competent, autonomous and related. Indeed, the motivational value of EDIT is the quality of EDIT that is most intensively described by teachers concentrating a total of 74 meaning units (27,5%) out of the total 268 meaning units. In general, the vast majority of teachers (11 teachers, 100%) see an intrinsic motivation value in EDIT at some point during the course giving emphasis to different aspects of the course. Half of teachers (6 teachers- 55%) described it as a whole interesting and motivating. For example, B1 wrote ''*It's an interesting, motivating and very appealing programme […]*'', which describes the feeling of satisfaction felt when someone's basic affective needs for competence, autonomy and relatedness are fulfilled.

a. *Satisfaction of teachers' need for competence*. Half of teachers (6 teachers- 55%) described EDIT as a whole, its content and tasks as challenging, i.e. not too easy or too difficult and setting high aims. Interestingly, and as it was hypothesized in this study, C1, for example, related EDIT challenging tasks with her development of growth mindset beliefs, '*(a) deeply reflective course which offers a new perspective on teaching, away from stereotypes with challenging tasks that help teachers believe in their students' growth potential (as well as theirs)*'. In addition, the majority of teachers (7 teachers -64%) saw an utility value in all of the these EDIT aspects i.e. usefulness to achieve their short or long term goals and be competent connected to their real practice, which has a motivational value (Barron and Hulleman, 2015). Half of the teachers (6 teachers- 55%) perceived EDIT as valuable

220

in helping them achieve effective teaching, others expressed their belief or certainty that DI is an effective approach to teaching and that EDIT can help teachers address student needs effectively. For example, H2 said 'It*'s a community that showed me the path to create lessons that lead to a successful approach to instruction which meets individual needs*.'

A few teachers (2 teachers – 18%) identified as helpful the knowledge they received on how to build meaningful learning elements and curriculums, while others (2 teachers – 18%) wrote that EDIT helped them envision their potential to achieve in the future. For example, G2 evaluating the positive attributes of EDIT wrote '*(l)earning how to build a meaningful learning element based on the principles of New Learning will hopefully make my job more meaningful to my students*'. In essence, what teachers described is how EDIT helped them feel more competent with a characteristic example their descriptions of the success they experienced with the implementation of DI in their classrooms.

b. *Satisfaction of teachers' need for autonomy.* The analysis has shown that half of the teachers (5 teachers, 46%) described EDIT as open to their lifeworld of everyday classroom practice. On the other hand, only a few teachers' (2 teachers- 18%) descriptions talked explicitly about their autonomous learning within EDIT. For example, D1 evaluated as positive the following autonomous learning attributes in a bullet form
   - '*guided training course; facilitated*
   - *self-discovery learning*'

Nevertheless, EDIT's strong reflective nature and teachers' involvement in constant self-reflection and reflection on their teaching practice is an important condition for teachers' satisfaction of their autonomy need.

c. *Satisfaction of teachers' need for relatedness.* The analysis revealed that EDIT community even though online and asynchronous satisfied to a certain degree teachers' need for relatedness. In fact, 'the community of EDIT' is the quality that

teachers described with greater intensity (with 63 meaning units - 23,5% out of the total 268 meaning units) devoting enough space in their descriptive accounts and evaluating it as one of EDIT's positive attributes. Half of teachers (5 teachers - 45%) focused on different aspects of affective sharing and self-disclosure within EDIT. For example, I2 said that what she valued in the program was '*sharing our ideas, practices, as well as worries and anxieties'*. According to Rourke et al. (1999) affective sharing and self-disclosure is defined as a sharing of feelings, attitudes, experiences and interests which increases trust, support and a sense of belonging within the community members.

The analysis revealed also their gradual development of a sense of belonging by the end of EDIT. In the middle of the program, there is only one teacher (10%) who refers to other colleagues using the term 'a community'. In particular, J2 described EDIT as *'A community of teachers working independently towards a common aim'*. In contrast, at the end of the program a quarter of teachers (4 teachers, 36%) used this inclusive noun. For example, F2 described EDIT as '*(a)n open professional community of experienced colleagues eager to learn more and to get out of their comfort zone to adapt to new situations'*.

7.4.3. A high-quality curriculum program

The analysis also showed that teachers perceived EDIT as a thoroughly planned meaningful curriculum focusing on understanding DI and characterized by drawing multiple connections within concepts. These are traits of a high-quality curriculum constituting the second most intensively described EDIT quality (with 31 meaning units – 11,5% out of the total 268 meaning units) in teachers' accounts of their EDIT experience. Indeed, the majority of teachers (7 teachers -64%) described themselves as having been involved in processes of active meaning making and working thoroughly on understanding DI, the nature of a high-quality curriculum and the process of learning. Characteristically, D1 wrote '*[..] It gave valuable insight into DI*

and helped us practise differentiated instruction. It made us understand the attributes of a HIGH-QUALITY CURRICULUM and how this can ensure effective teaching.'

In the same manner, EDIT content and tasks are described as well organized, structured, cohesive and meaningful, while the material of EDIT concentrated teachers' attention (6 teachers -55%) because of its quality, multimodality, wealth and range. For example, F2 commented *'(n)ice material to learn from, for example the TEDs'*. Garrison and Cleveland-Innes, (2005) argue that material is embraced and mastered in a deep approach to learning in learners' search for meaning. As a direct indicator of the EDIT material's multimodality and drawing of various connections, the majority of teachers (7 teachers, 64%) concentrated on EDIT Ted talks, i.e. the audiovisual medium of the programme, the EDIT articles (4 teachers, 36%) , i.e. its written medium, and the influential role of the community (2 teachers, 18%), that is, the colleagues and the instructor sharing their learning elements, thoughts and experiences. For example, G2 referred to the following as influential EDIT material, *'(t)he TedX talks, the videos about how we learn, Maria's sharing of her own thoughts and experiences, theories about the two mindsets, Dweck's and Konnikova's excerpts'*.

What is more, as a direct indicator of high-quality curriculum placing emphasis on essential knowledge, teachers paid special tribute to the programme's content and ideas. As it has already been mentioned, special reference was made to the 2nd LbD cycle talking about Dweck's theory of the growth and the fixed mindsets, the concepts of vulnerability, shame, resilience, and neuroplasticity showing how the brain learns. In parallel, a few teachers said that they sometimes could not see the big picture, i.e. what was the purpose of some of the tasks or how the different parts of the program connected. J2 wrote '*First of all, there's no clear cut outline of the programme, so I am sometimes confused as to how things connect together.*'

On the other hand, less than a quarter of teachers (3 teachers, 27%) would prefer EDIT to devote more time with DI implementation than what they called 'theory'. Two of these comments were made in the middle of the program, where some teachers had not yet implemented the two learning elements of the first two cycles. For example,

I2 wrote '*The negative attributes are that there is no practice so far concerning differentiated instruction, no guidelines, but we only concentrate on trying to understand students and ourselves and we haven't learnt anything about how we can put the theory into practice. I have understood the theory so far, about different perspectives and stereotypes, the two mindsets, etc, but I have no idea how to create lessons that will be meaningful to each and every student according to their starting point, learning needs or style, etc*'.

7.4.4. A developing online asynchronous community

From the analysis, there emerged the core role that the community of practice played in teachers' learning and affective engagement with the program. The vast majority of teachers (10 teachers, 91%) saw a value in the role that the community played in their learning. For example, E1 wrote '*(s)ince this is a year-long program, working within the framework of a community is of extreme importance, as it offers ample opportunity to exchange ideas and experiences and to share anxieties; eventually, to evolve with your colleagues*'.

Teachers' descriptions referred to different types of intellectual sharing within the community members such as sharing of ideas, opinions, and beliefs, sharing of practices and resources, resulting in the following types of *mutual learning*, a) enriching their thinking and understanding by exchanging ideas and opinions, b) opening up their egocentric thinking and c) enriching their teaching practice through other colleagues' contributions such as learning element resources. For example, half of the teachers (5 teachers, 46%) commented on the value of experiencing diversity within the community and seeing others' different perspectives, a process which results in teachers' widening of egocentric understanding, and thus becoming more open to diversity. Characteristically, G2 consciously acknowledged that the role of the community was significant because '*(s)haring views has widened the way I perceive teaching and I understand my students*' and C1 admitted '*I always read the comments, the learning elements and it's interesting to see different points of view or something that I had never thought of*'.

As it has already been mentioned, half of teachers (6 teachers, 55%) focused on different aspects of affective sharing and self-disclosure within EDIT giving emphasis to the affective role that the community played in their learning, that is, its motivational value and emotional support ranging from others' comments arousing their interest to feeling a sense of belonging to the community. A few teachers (3 teachers, 27%) found value in feeling connected through personal sharing of experiences, anxieties, problems.

Teachers' descriptive accounts (8 teachers, 73%) concentrated mainly on aspects of open communication within EDIT community by making a direct reference to interaction as a valuable aspect of EDIT. For example, F2 wrote in a bullet form that a positive attribute of EDIT was '*a. The cooperation of many experienced teachers exchanging ideas and expressing their opinion […], f. Professional cooperation and support*'. Others (5 teachers, 45%) gave emphasis to their interaction with the tutor as a provider of intellectual and scholarly leadership, and half (5 teachers, 45%) to the content of other community members' messages. Characteristically, G2 wrote that '*(i)t was altogether a positive experience. The professional job provided by the instructor but also the important contributions of my colleagues made me feel part of an advanced learning community*'.

At the same time, though, half of teachers (5 teachers, 46%) commented on the absence of interaction between teachers in the community, that is, teachers shared their opinions in the form of monologues in the context of responding to the weekly task. As a result, each teacher shared their opinion but without responding directly to others' comments. For example, I2 wrote '(t)*here is no interaction with my colleagues, unfortunately, there is no direct communication, with the exception of one person I already knew and with whom we sometimes talk on the phone (not on the platform) and the administrator. I always read their comments and their answers to the tasks, but I have noticed that the only person who comments on what we have answered is the administrator*'. Nonetheless,

despite the absence of direct interaction between community members, there seemed to be a great number of teachers who participated vicariously in the discussion and always silently reading others' comments. As Garrison and Cleveland-Innes (2005) argue meaningful engagement and cognitive presence in a community may also include vicarious engagement by following the discussion, reflecting on the discourse and constructing meaning individually.

In addition, half of the teachers (6 teachers, 55%) had difficulties with EDIT's online asynchronous nature, particularly *asynchronous collaboration* with others, which brought up a number of emotions, disorienting dilemmas and enlightenments to teachers about the nature of collaboration, something that they often ask their students to do without being aware of the challenges such an endeavor could have for them. In particular, a quarter of teachers (4 teachers, 36%) explained that they found it difficult to coordinate and cooperate with the rest of the community, while a few others identified as main hindrance their time availability (4 teachers, 36%), the Scholar platform which they (4 teachers, 36%) characterized non-friendly to use and the fact that they (3 teachers, 27%) did not know each other well commenting on their need for more face-to-face interaction as a means of fostering more trust between them. D1 referring to EDIT negative attributes wrote that '*(t)hey have to do with asynchronous learning and online collaboration. Time availability of learners and freedom to carry out tasks at their own pace being an advantage of distance learning became a drawback when having to do collaborative tasks because it was not easy to find some common free time to communicate and cooperate so as to carry out these tasks*'.

On the other hand, what teachers identified as facilitating factors for making use of the community were a) the content and material of EDIT, (3 teachers, 27%), b) the community communication, which these teachers found easy and constructive, (2 teachers, 18%), c) the platform, which one teacher found easy to use (1 teacher, 10%), and d) asynchronous learning (1 teacher, 10%) . For example, K2 wrote '*I think that I have made full use of the community of practice. A facilitative factor was the use of all*

resources in my own time. Also the materials you gave us were unambiguous and the ideas that were put forward in the forum were valuable and constructive'.

What these factors reveal is that asynchronous learning was a convenient form for TPD due to teachers' very limited time availability but not very effective for teachers' collaboration which requires greater time adjustments for teacher synchronization. Finally, the high-quality of EDIT curriculum, i.e. its content and material, played an important role to the functioning of the community as well by involving teachers' in meaningful intellectual engagement and, thus, fulfilling the gap of a developing sense of belonging and trust among its members.

7.4.5. A program with frustrating time aspects

The vast majority of teachers' descriptive accounts (10 teachers, 91%) of what they perceived as negative EDIT attributes focused on different frustrating aspects related to time such as a) their own   heavy professional and personal schedules which were constraining in terms of the time they had at their disposal for EDIT, (4 teachers, 36%) , b) they perceived EDIT itself demanding in terms of time, (4 teachers, 36%), c) they found stressful the weekly deadlines of EDIT, (4 teachers, 36%), d) EDIT's non-alignment with important school time periods such as the final exams, (3 teachers, 27%) and e) its long duration (2 teachers, 18%). Characteristically, F2 wrote *'(a)t times it gets too much because I am involved in a number of things (seminars, Erasmus, etc). Generally speaking, though, the load is expected and can be handled,* while H2 wrote '(t)ime management is another negative point. The exam period (May-June) was loaded with assignments/projects.' In fact, one of the conditions teachers set for prospective EDIT participants is their time availability, as it has already been mentioned.

 Overall, the analysis has shown that EDIT tasks took teachers from 2 hours per week (minimum) to 5 hours per week (maximum) depending on the nature of the task with lesson planning requiring more time than the usual tasks. For example, H2 referring to the amount of time the EDIT tasks took her per week wrote '*(i)t depends on the*

task. A couple of hours or even days, when I had to design and implement a lesson which was extremely rewarding despite the hard work'. Likewise, the amount of work they had to do during EDIT varied from week to week, but it was 'too much, at times' in relation to their other school and personal responsibilities, the weekly deadlines, other seminars that they attended in parallel, and the amount of self-reflection and observation required. Nevertheless, the fact that teachers persisted with EDIT, where their participation was voluntary, despite their heavy time schedules is an indirect indicator of the value they found in it.

7.5. Conclusion

In conclusion, the statistical part of the analysis has drawn a succinct and clear picture of the 11 participant EFL teachers' profile of the EDIT case study. In particular, this was a sample of highly qualified, experienced mainly middle-aged teachers with a high interest in their PD working in Greek General High Schools and Experimental Model High Schools. The great majority reported that they differentiated in their classroom before EDIT despite the absence of any previous formal training in DI. Nevertheless, the majority of teachers focused solely on language competence differences between their learners while the DI practices they reported using represented practices of the linear transmissive teaching tradition in schools where teachers assume no responsibility for the creation of appropriate learning conditions and processes for learners to learn, underlain by the assumption that teaching equals teacher telling, asking questions to students, giving tasks, using materials and methods for students to learn effectively. In addition, the analysis of teachers' practices revealed their avoidance of open communication with their students or colleagues further stressed by the fact that the least popular DI practices they used related to purposefully grouping students.

The second part of the analysis explored teachers' satisfaction with EDIT and gave some valuable insights about the teachers' experience with the programme and its success in achieving the aims it set at the beginning. Overall, the results of the analysis from teacher's levels of satisfaction with EDIT showed that:

a) it has been a successful programme. Taking a look at the values of EDIT that teachers ranked at the top level of satisfaction, i.e. highly satisfied, and the lowest ranking, i.e. satisfied, it is assumed that EDIT has been a transformative TPD on DI programme. In particular, the statistical analysis has revealed that teachers' ranking of their development of self-reflection remained at the top ratings throughout the programme, while after EDIT teachers' felt highly satisfied with the way it changed their understanding of their students' different needs, a core EDIT aim for teachers' development of openness to diversity. Interestingly, teachers' rating of their understanding of students' different needs was higher at the end of EDIT than in the middle right after the end of the first two LbD cycles, whose focus was actually this, i.e. raising teacher awareness of their students' different needs. It is, thus, inferred that teacher understanding grew over time through their experience with and more careful observation of students in their real contexts underlining the fact that such a deep understanding takes time to develop.

These results agree with the first emergent theme of the qualitative content analysis of the third part of the chapter, i.e. EDIT as a transformative programme described as a springboard for constant reflection, an innovative experience of DI, and reported teacher change. Indeed, again, the majority of teachers make an explicit reference to their involvement in a) processes of self-reflection, b) reflection on teaching practice, c) reflection on teaching and learning stereotypes, and d) reflection on the relation between teachers and students. The teachers also described EDIT as an innovative experience. The analysis has shown that teachers experienced as new both their differentiation experience and their own DI implementation experiences in their classrooms with their students. The content and material of EDIT, especially that of the 2nd LbD cycle, appear to have played an important contributing role both to shedding light to previously hidden from consciousness content. That is why teachers made a special mention to the novelty of EDIT content, the creativity of EDIT tasks and the Ted talks they watched. Primarily, though, the transformative processes teachers went through resulted in important teacher

change: a) turning their attention to students, better understanding them and becoming more open to student diversity, b) turning their attention to themselves as teachers and reframing their self-perceptions resulting in more holistic changes in their professional development, c) changing their relationship with some of their students or whole classes, and d) reframing their teaching practice

b) from the statistical analysis it is also inferred that EDIT has been a meaningful TPD on DI programme for teachers since teachers rated it as highly satisfying on the way it drew connections to their previous knowledge in the middle, the way it addressed essential knowledge, its relevancy to their professional needs and their learning and development at the end. It is interesting to note that in the middle of EDIT teachers ranked very highly EDIT's value in terms of the access it gave them to documents or sources of information. In the same line, one of the emergent themes of the qualitative content analysis is EDIT as a high quality curriculum, which is a thoroughly planned meaningful curriculum focusing on understanding DI and characterized by drawing multiple connections within concepts. What is more, EDIT content and tasks were described as well organized, structured, cohesive and meaningful, while the material of EDIT concentrated teachers' attention because of its quality, multimodality, wealth and range.

c) it has been an intrinsically motivating programme. In particular, the statistical analysis has shown that in the middle of EDIT teachers were highly satisfied with the way it addressed their interests, the way it challenged them and the way it addressed their learning preferences, i.e. their learning styles. After EDIT, though, teachers were still highly satisfied with the way EDIT had challenged them. It is only their evaluation of the way it addressed their interests and learning preferences that decreased, i.e. very satisfied, at the end of EDIT. This drop at their levels of intrinsic motivation could be due to their tiredness at the end of a yearlong and quite demanding programme or the nature of the 3rd and the 4th LbD cycles, which were less self-reflective than the

previous two cycles focusing on teacher understanding of high-quality learning element design principles along with the LbD knowledge processes. In addition, the second part of EDIT was more tight in terms of deadlines and possibly more demanding for teachers.

In agreement with the quantitative analysis, the qualitative analysis has also shown that EDIT was an intrinsically motivating programme for teachers, which i) satisfied their need for competence with challenging tasks, and helping them experience success in their classrooms with DI, ii) satisfied their need for autonomy by welcoming teachers' thoughts, feelings and actions to their learning, giving them choices and involving them in constant self-reflection and reflection, iii) satisfied their need for relatedness through the online and asynchronous EDIT community where teachers shared and self-disclosed their feelings, attitudes, experiences and interests gradually developing a sense of belonging to the community.

d) it has been a developing community. The qualitative analysis revealed the core role that the CoP played in teachers' learning and affective engagement with the program. The vast majority of teachers acknowledged the role that the community played in their mutual learning such as a) enriched teacher thinking and understanding through exchange of ideas and opinions, b) opening up of teacher egocentric thinking and c) enriched teaching practice through others' contributions such as learning element resources. At the same time, half of teachers focused on the motivational value of the community and the emotional support they experienced through personal sharing of experiences, anxieties, and problems.

Teachers' made also a direct reference to interaction within the community as a valuable aspect of EDIT. Interestingly, those teachers gave emphasis to their interaction with the tutor as a provider of intellectual and scholarly leadership, and the content of other community members' messages. In parallel, half of teachers referred to the absence of interaction among teachers in the

community since teachers did share their opinions within the community but that sharing took the form of monologues in the context of responding to the weekly tasks, and not as a direct response to others' comments. In accordance, the statistical analysis has shown that teachers ranked very low their satisfaction with their interaction with others within the community throughout EDIT. In particular, there was a slight increase comparing teacher rating in the middle and after but still this value of EDIT remained at the lowest.

What connects with this aspect of EDIT community interaction are the difficulties teachers experienced with asynchronous collaboration with others. A quarter of teachers found it difficult to coordinate and cooperate with the rest of the community, while a few others identified as main hindrance their time availability, the Scholar platform which they characterized non-friendly to use and the fact that they did not know each other well commenting on their need for more face-to-face interaction as a means of fostering more trust between them.

There seemed, though, to be a great number of teachers who participated vicariously in the discussion and always silently reading others' comments. That is why teachers' trust and sense of belonging to the community did increase over time. In accordance, the statistical analysis showed that teachers' were the least satisfied with the social aspects of the Community of Practice such as their sense of belonging to the community, interaction with others, or the level of trust felt within the community. Nevertheless, at the end of EDIT the trust teachers felt within the community increased while their sense of belonging to the community showed the greatest increase in the level of satisfaction in comparison to the middle of EDIT. Overall, the high-quality of EDIT curriculum, i.e. its content and material, played an important role to the functioning of the community as well by involving teachers' in meaningful intellectual engagement and, thus, facilitating the development of a sense of belonging and trust among its members.

e) It has been a demanding program in terms of teachers time availability resulting in teacher frustration due to i)) their own heavy professional and personal schedules which were constraining in terms of the time they had available for EDIT, ii) EDIT's demanding nature in terms of time, iii) the weekly deadlines, iv) EDIT's non-alignment with important school time periods such as the final exams, and v) its long duration.

To sum up, EDIT has managed to build what were hypothesized to be necessary conditions for effective TPD on DI. It has been transformative, intrinsically motivating, with a high-quality curriculum in the context of a developing asynchronous online CoP. The following chapter focuses on EDIT effects, i.e. how effective it has been in transforming teachers frames of reference so as to develop more open to diversity mindsets and behaviors.

Chapter 8

EDIT effectiveness in transforming teachers' educational frames of reference

8.1. Introduction

This chapter answers the 2nd research question of the study asking 'how effective has EDIT been in transforming the 11 participant teachers' frames of reference' by presenting the triangulated quantitative and qualitative data from the three questionnaires in the beginning, the middle and the end of EDIT. According to Calleja (2014), transformation of perspectives, or else habits of mind, is a recursive, spiral, cumulative process that spreads over a period of time. Thus, the results of the analysis explored longitudinally the extent to which EDIT was successful in the development of the participant teachers' more open to diversity frames of reference. The presentation of the analysis results is divided into two parts. The first part presents teachers' openness to diversity profile through their learner diversity and differentiated teaching perceptions and practices before EDIT. The second part presents teachers'

openness to diversity profile after EDIT along the same dimensions of learner diversity and differentiated teaching perceptions and practices tracking teacher change due to the participants' participation in the program.

In more detail, the first part of the presentation starts with the results of the descriptive statistical analysis of the closed questions of the first questionnaire exploring the participant teachers' open or non-open to diversity assumptions underlying their perceptions of DI importance for effective learning, learner diversity and DI practices such as needs analysis, use of the school textbook, grouping of students, provision of extra material for struggling and advanced students, etc. right before EDIT. Teachers' quantitative open or non-open to diversity profile at the beginning of the program is then complemented by the results of the quantitative and qualitative content analysis of the open-ended questions of the first questionnaire exploring again through a different means teachers' perceptions of differentiated teaching and their learners.

The second part of the presentation focuses on teacher change towards greater openness to diversity from the middle on to the end of the program. In particular, the presentation begins with the results of the descriptive statistical analysis of the first and the final questionnaires exploring change in teacher openness to diversity after EDIT with respect to teachers' fixed or growth mindset assumptions, their level of awareness of student diversity, and their understanding of how students learn according to DI principles. This section of statistical analysis is then complemented by the results of content analysis of the same set of open-ended questions of the 3rd questionnaire like those answered by teachers in the 1st questionnaire before EDIT. These results explore teacher change in their perceptions and practices with respect to differentiated teaching and learner diversity. Teacher change after EDIT is, then, further explored through the additional presentation of the results of the content analysis of the open-ended questions of the 2nd and the 3rd questionnaires asking teachers to self-report on any changes they identified in the middle and the end of the program.

8.2. Teacher openness to diversity before EDIT

This section presents the results of the descriptive statistical analysis of the closed-ended questions and the results of the quantitative and qualitative content analysis of the open-ended questions of the 1st questionnaire exploring teachers' open or non-open to diversity assumptions before EDIT along two core dimensions, learner diversity and differentiated teaching.

8.2.1. Statistical analysis of teachers' openness to diversity before EDIT

Teachers' degree of openness to diversity before EDIT has already been presented as part of the statistical findings exploring teachers' DI related perceptions and practices before EDIT as part of EDIT teachers profile at the beginning of the program (see 7.2.3.). What these results showed is that teachers before EDIT were already aware of student diversity giving emphasis on their students' different language levels while they not only valued DI but they also implemented it within a school context where the resources at their availability, i.e. the school textbook was slightly useful due to its limited content. The analysis also pointed towards teachers' humanistic teaching orientation and their implementation of DI practices with an emphasis on the use of different material in a variety of modalities paying greater attention to struggling student needs since they most often provided extra materials to support students who had difficulty understanding course content instead to those who master course content with minimal effort. What is more, the results show that among teachers least frequently used practices were core DI learning processes such as learning with others through purposeful grouping of students and teacher support of student autonomy by offering choices taking into account their different learning preferences and interests. It is important to note, though, that this profile of teachers' DI practices before EDIT is drawn from a set of options given to teachers, and not from practices that they themselves described. Teachers' own self-reports of the DI practices they used before EDIT is presented in the next section.

8.2.2 Quantitative and qualitative content analysis exploring teacher openness to diversity before EDIT

This section presents the results of the quantitative and qualitative content analysis of the open-ended questions of the first questionnaire exploring teachers' perceptions of differentiated teaching and their learners before EDIT. In particular, the questions asked about teachers' perception of DI importance for effective learning, how and what they differentiate, their perception of their role as teachers, and their perception of students with different levels of achievement, i.e. struggling and advanced students, who are often stereotyped by teachers. The first theme emerging from the analysis of teachers' responses before EDIT could be succinctly described as *teachers putting the onus for learning on students,* characteristic of fixed mindset classrooms and non-openness to diversity.

8.2.2.1. Teachers putting the onus for learning on students

The quantitative and qualitative content analysis of teachers' answers to the question 'How important do you think differentiated instruction is for effective learning?' showed that before EDIT the majority of teachers' descriptions (8 teachers, 73% in 11 meaning units) of DI were quite abstract and superficial assuming no responsibility for the creation of appropriate conditions and processes for learners' learning. In essence, before EDIT half of teachers (6 teachers, 55% in 6 meaning units) talked about DI in terms of the linear transmissive teaching tradition underlain by the assumptions that the main teacher role is to 'teach' and learners to 'acquire knowledge' while the use of methods and distribution of material are central teaching activities. For example, G2 wrote *'(e)ach student can get the most suitable for them kind of teaching and thus have the opportunity to meet their needs' (see Appendix, Table 1 for more teacher cases).* In addition, almost half of teachers' descriptions (5 teachers, 45% in 5 meaning units) focused on motivation as an important effect of DI. Motivation, though, is again described as a linear automatic process where no concrete DI motivational processes and conditions are needed. For example, K2 wrote *'All students should feel that they gain something from their language courses so that they can feel they are part of the group'* (see Appendix 7, e.g. K2 case).

The quantitative and qualitative analysis of teachers' answers to the question 'Do you differentiate? If yes, could you specify how and/or what do you differentiate?' has shown that before EDIT the majority of teachers' DI practices (7 teachers, 64% in 14 meaning units) represented practices of the linear transmissive teaching tradition in schools such as a) *giving* students *different tasks* (3 teachers, 27%), b) *using various teaching methods and tools* (2 teachers, 19%), c) varying the material (2 teachers, 19%), d) teacher *asking different questions* to advanced and struggling students (2 teachers, 19%), e) *giving different instructions* (1 teachers, 10%), f) *varying the length of time* (1 teachers, 10%) , g) *using both languages,* English and Greek (1 teachers, 10%).

These all are practices with an external focus on what the teacher does, not what or how the learners learn, where teachers assume no responsibility for the creation of appropriate learning conditions and processes for learners to learn, underlain by the assumption that teaching equals teacher telling, asking questions to students, giving tasks, using materials and methods for students to learn effectively. Even the rationale of a few teachers' account (3 teachers, 27%) for not differentiating reveals their external focus to environmental conditions such as time, the number of students, noise, or absence of classroom equipment, for their not assuming any responsibility for learners' learning (see Appendix 8, e.g. H2). Only a few teacher practices (2 teachers, 19% in 3 meaning units) before EDIT focused on humanistic teaching learning processes, which are in line with DI, such as learner grouping and collaboration.

The same pattern is revealed in the analysis of teachers' answers to the question 'Write 5 words or expressions that come to your mind when asked to complete the sentence: My role as a teacher is…'. The great majority of teachers' descriptions (9 teachers, 82%) before EDIT included aspects of learner centered teaching imbued by learner centered *aims* such as developing learner autonomy or motivating students, but the *process* described for achieving those aims by the great majority of teachers (9 teachers, 82% in 13 meaning units) was often abstract, linear, transmissive and

controlling using the syntax 'make students do something', i.e. no reference is made to conscious learning processes and conditions but the teacher is assumed to directly cause learning or motivation in linear one-way controlling interactions where learners are passive listeners).For example, G2 saw her role as one of *'(f)acilitator, policewoman, psychologist, instructor, role model' (see Appendix, Table 3, for more cases).*

With respect to the learner centered aims, the analysis showed that half of teachers (5 teachers, 46%) described their role as one of facilitating learning and supporting learners (see Table 3. e.g. G2). A few teachers (3 teachers, 27%) focused on learner needs and diversity (see Appendix 7, e.g. B1). A few teachers (3 teachers, 27%) gave a description of a rather affectionate teacher role, who cares for her students but with no indication of embracing diversity (see Appendix 9, e.g. I2). Finally, a few teachers (2 teachers, 19%) described a more communicative role of teachers, where they appear to interact with their students (see Appendix 9, e.g. H2).

8.2.2.2. Teachers' perception of their learners: focusing on language proficiency differences and differential treatment of students

With respect to the participant teachers' perceptions of learner diversity before EDIT, the results of content analysis of the quantitative and qualitative content analysis have shown that before EDIT half of teachers (5 teachers, 45% in 7 meaning units) wrote about their DI practices taking into account learner diversity such as learners' different ability, language levels, interests, needs, and learning style. In addition, half of teachers (N=5, 46 %.) focused solely on language competence differences between their learners. For instance, H2 wrote that her learners differed with respect to their '*vocabulary, grammar, writing, speaking'*. A few (N=2, 18%) referred solely to differences in terms of learners' family and cultural background. For example, E1 wrote '*(i)n some of my classes, the students differ significantly as to their family backgrounds, something that – to a certain degree – affects their aspirations and dreams for the future'*. One teacher (N=1, 10%) perceived differences in their ways of

learning such as intelligences and learning styles, while one teacher (N=1, 10%) referred to students' interest for learning English as a foreign language.

In essence, these qualitative results triangulate the statistical analysis results above revealing teachers' relevant awareness of student diversity with a greater focus on language level differences. It is also important to note, though, that a few teachers (3 teachers, 27 %), focused on fixed learner traits such as learner genes referring to DNA, learning pace and learner difficulties before EDIT, while after EDIT there are no such fixed trait learner descriptions. *For example, E1 wrote '(e)ven in homogeneous classes, not all students have the exact same level in terms of linguistic competence. Even more significantly, each student has different genes and different experiences; so, they have significantly different interests, dreams'.* What is more, a quarter of teachers (4 teachers, 36%) explicitly refer to DI having in mind solely low achieving students. These results agree with research that has most demonstrably proven that gifted children are all too often both overlooked in their classrooms from their general education teachers, who often teach to the average or even to the struggling learner (Tomlinson and Callahan, 1992; Tomlinson, 1992).

With respect to teachers' differential treatment of their students the analysis results of teachers' answers to the question C1.a. 'Write 3 words that come to your mind when asked to complete the sentence: The differences between struggling and advanced students are….' is more revealing. In particular, the majority of teachers (7 teachers, 64%) before EDIT talked about differences in struggling and advanced students' motivation putting the onus for motivation on students (see Appendix 10, e.g. B1, C1). That way, motivation was presented as a personal trait and the focus was put on the person, not the teaching process, which is typical of fixed-mindset thinking. As Dweck (2015) argues if teachers endorse fixed mindsets about their own teaching ability, they are likely to feel threatened by low-performing students tempted to blame students and their ability for not responding to their teaching. Half of teachers (5 teachers, 46%) in their descriptions focused on student achievement and performance showing a fixed-mindset towards their tracking of students by ability. For example, F2 saw struggling and advanced student differences as '*(h)orrendously great,*

difficult to bridge, desperate' (see Appendix,10 for more cases e.g. I2, J2). At the same time, less than half of teachers (4 teachers, 36%) before EDIT used also adjectives describing differences in a more open to diversity manner in terms of inner psychological and learner lifeworld descriptions such as students' different learning styles, needs in general and their background (see Appendix 10, e.g. C1, K2).   For example, K2 wrote about differences in '*(m)otivation, effort, learning styles'.*

In contrast to the results of the question focusing teachers' attention to student differences, which revealed teachers' fixed mindset perceptions of students, question C1.b which focused teachers' attention to student similarities seems to have played a role in bringing out teachers' greater openness to diversity before EDIT . Epley (2014) acknowledges that one of the main reasons for the creation of stereotypes is people's natural tendency to try to make sense out of the world through the cognitive process of comparison and the identification of differences between entities in order to categorize objects, ideas, people, etc. That way, though, differences are often exaggerated and evidence of similarities overlooked leaving attributes of difference to define a group and its members. Thus, it is inferred that question C1.b by focusing teachers' attention to student similarities helped alleviate teacher stereotypical thinking of their struggling and advanced students.

As a result, the analysis showed that the great majority of teachers (9 teachers, 82% in 13 meaning units) revealed a degree of openness towards diversity before EDIT. In particular, half of teachers (6 teachers, 55% in 10 meaning units) described learner similarities in terms of inner subjectivity such as students' interests, need and willingness to learn, beliefs, and feelings (see Appendix 11, e.g. K2, B1). A few teachers' descriptions (3 teachers, 27%) even involved situational thinking describing learner similarities in terms of the teaching context (see Appendix, Table 5, e.g. D1).   For example, D1 wrote that their similarities are that *'(t)hey may lose motivation if learning content is not relevant to them'.* Focusing on similarities, it is only a few teachers' descriptions (2 teachers, 19%), which revealed more stereotypical and fixed mindset teacher thinking focusing on students' external commonalities like

performance, behavior or even that of sharing the same class (see Appendix 11, e.g. H2, F2).

What is more the analysis of teachers' answers to the question C1.c asking them to describe the greatest challenge in teaching struggling and advanced students, showed that before EDIT the vast majority of teachers (10 teachers, 91% in 16 meaning units) assumed more responsibility for advanced students' learning than struggling students learning. In essence, they reported that the greatest challenge for them in teaching advanced students was how to intrinsically motivate them, i.e. arouse their interest, and challenge them, both of which refer to particular motivational aims and processes (see Appendix 12, e.g. B1, D1). Half of teachers (6 teachers, 55% in 10 meaning units) focused on the challenges of their learning and appeared more knowledgeable referring to particular processes and learning aims such as building on their prior knowledge or using the English language to produce meaningful spoken and written discourse. For example, E1 wrote that a challenge in teaching advanced learners is '(e)*ffectively building on existing knowledge'.* That way they communicated their high expectations of advanced students' learning and their belief in their potential to learn. A few teachers (3 teachers, 27% in 4 meaning units) focused on how they can be facilitative to their learning and they set higher-order autonomy-supportive aims such as awareness raising and metacognitive aims of autonomy. For example, C1 wrote that she found challenging '(t)*o engage them in challenging activities or projects and maximize their potential to use the language producing meaningful spoken and written discourse. Also, to help them realize that language learning goes beyond the rigid boundaries of testing and certification and is a real window to the world'.* Finally, a few teachers (2 teachers, 19%) were concerned with how to challenge advanced learners, i.e. so that they learn more (see Appendix 12, e.g C1).

With respect to struggling students, the great majority of teachers (8 teachers, 73% in 14 meaning units) before EDIT described as a challenge their attempts to make them believe that they can learn. It is important to note, though, that teachers' focus with respect to struggling students was different to their focus with respect to advanced students learning for whom they actually tried to create the appropriate conditions

for learners by setting learning aims. Their focus now was to try to make them believe that they can learn by putting actually the onus for learning on them in a controlling and transmissive teaching manner, i.e. 'make them believe' (see Appendix 12, e.g. I2, G2). Half of teachers (6 teachers, 55%) referred to the challenge of motivating struggling students.

However, motivation is perceived in a more controlling manner, i.e. the teacher directly causing motivation to students, in comparison to advanced students, where teachers concern was how to arouse advanced students' interest or challenge them, i.e. create the conditions for intrinsic motivation (see Appendix 12, e.g. I2). What is more, before EDIT, only a few teachers (2 teachers, 19%) referred to learning with respect to struggling students, and their focus was mainly on linear transmissive teaching communicating low expectations of merely coming up with an answer (see Appendix 12, e.g. A1, H2). For example, A1 wrote that '*(f)irst of all you have to switch around what these students need to learn, then you have to give them the tools to learn to encourage them to come up with an answer'.* Finally, a few teachers (2 teachers, 19%) were concerned with how to make struggling students feel safe, in contrast to advanced students, where the focus was on challenge, indicating, possibly, teachers' perception of struggling students as needing protection (see Appendix 12, e.g. C1).

8.3. Teacher openness to diversity after EDIT

This section presents: a) the results of the descriptive statistical analysis of the closed-ended questions of the first and the final questionnaires exploring change in teacher openness to diversity after EDIT, b) the results of the quantitative and qualitative content analysis of the open-ended questions of the 3rd questionnaire exploring teachers' open or non-open to diversity assumptions after EDIT along two core dimensions, learner diversity and differentiated teaching., exactly like before EDIT, and c) teacher self-reports of identified change in the middle and the end of the program.

8.3.1. Statistical analysis of teachers' developing openness to diversity after EDIT

This section presents the results of the descriptive statistical analysis of questions 1 to 15 (Part C3) and questions 1 to 10 (Part D) of the first and the final questionnaires exploring change in teacher openness to diversity after EDIT by measuring on a 5-point Likert scale the central tendencies before and after EDIT. Overall, post-intervening teacher beliefs have changed considerably towards more open to diversity mindsets in the majority of the survey questions presented in this section.

In particular, questions 1, 2, 3, 5, 7, 8, 9, 11, 13, 14 (part C3) explore teachers' fixed or growth mindset assumptions regarding student potential to grow and teacher

	Before the intervention				After the intervention			
	Mean	**Std. Deviation**	**Min**	**Max**	**Mean**	**Std. Deviation**	**Min**	**Max**
1. Struggling students have very low chances of success	**3.73**	0.786	2	5	**4.18**	0.603	3	5
2. Teachers are very limited in what they can achieve because students' home environment largely influences their achievement	**3.27**	0.786	2	4	**3.82**	0.874	2	5
3. Students have a certain amount of intelligence and teachers really can't do much to change it	**3.91**	0.701	3	5	**4.00**	1.095	1	5
5. When teachers really try, they can get through to most difficult students	**3.91**	0.831	3	5	**3.82**	1.079	2	5
7. All students can be successful	**3.36**	0.924	2	5	**4.27**	0.786	3	5
8. Students can learn new things but they can't really change their basic intelligence	**3.45**	0.688	2	4	**3.82**	0.982	2	5
9. The negative influences of students' home experiences can be overcome by good teaching	**3.27**	0.647	2	4	**3.55**	1.036	2	5

11. Advanced students are learners of high ability	**2.64**	0.924	1	4	**2.45**	0.934	1	4
13. All students can experience success by the teacher adapting the syllabus	**3.82**	0.751	3	5	**4.00**	0.632	3	5
14. Students' intelligence is something about them that teachers can't change very much	**3.18**	0.751	2	4	**3.91**	0.701	3	5

Table 8.3. Results for questions that measure teachers fixed or growth mindsets before and after the intervention

potential to have an effect on it. Table 8.3 presents the results of the participant teachers' fixed or growth-mindset assumptions before and after EDIT.

The results of the survey after EDIT show considerable teacher change towards more growth mindset assumptions concerning both their students, i.e. their belief in student ability to change and learn, and themselves, i.e. their belief in their own ability to positively contribute to student learning. For example, the central teacher tendency mean=3.36 before EDIT has changed to mean=4.27 after EDIT with respect to a central DI teacher belief in all students' potential to be successful indicated in the question 7 'All students can be successful'. In a parallel manner, teacher belief in their own potential to assume responsibility of student learning and change became stronger after EDIT mean=3.82 in contrast to mean=3.27 before EDIT in response to question 2 'Teachers are very limited in what they can achieve because students' home environment largely influences their achievement' . Two exceptions to this tendency towards a more growth mindset after EDIT appeared with respect to the questions 5 'When teachers really try, they can get through to most difficult students' and question 11 'Advanced students are learners of high ability' where teacher responses display a more fixed mindset after EDIT. These statements refer to the two extremes of student ability, i.e. most difficult students and advanced students, in which cases teachers appeared to perceive those abilities as fixed with no potential to change. It is, thus, inferred that teacher change towards more growth-mindset assumptions after EDIT

referred mainly to teacher belief in their own potential to assume more responsibility in their classroom, rather than their students' inherent abilities.

Questions 4, 6, 10, 12, 15 (part C3) explore teachers' level of awareness of student diversity. Table 8.4 presents the results of teacher beliefs concerning student diversity before and after EDIT. The only exception refers to the question 15 'Students differ significantly in their preferred ways of learning, e.g. visual, auditory, kinesthetic, linguistic, logical, inter personal', where teacher responses showed an inconsistency tending towards less openness to diversity. A possible explanation might relate to the focus of the programme, which insisted on preparing multimodal

	Before the intervention				After the intervention			
	Mean	Std. Deviation	Mir	Max	Mean	Std. Deviation	Min	Max
4. Giving all students equal opportunities to learn means teaching all learners the same thing, in the same way, over the same time span	4.82	0.405	4	5	5.00	0.000	5	5
6. Students differ significantly in their interests with regard to course content	2.36	0.809	1	4	3.91	1.136	1	5
10. Students have different starting points with respect to the subject matter that is to be taught	4.27	0.905	2	5	4.64	0.505	4	5
12. Giving all students equal opportunities to learn means offering several different ways to learning, different content, over different time span	4.45	0.522	4	5	4.45	1.214	1	5
15. Students differ significantly in their preferred ways of learning, e.g. visual,	4.73	0.467	4	5	4.45	1.214	1	5

	auditory, kinesthetic, linguistic, logical, interpersonal		

Table 8.4. Results for questions that measure teacher's beliefs about student diversity change before and after EDIT

learning element and offering different pathways to learning for all learners regardless of the particular learners actual preferences.

Questions 1 to 10 (part D) explored teachers' understanding of how students learn according to DI principles. Table 8.5 presents the results of teachers' understanding of how different students learn.

	Before the intervention				After the intervention			
	Mean	Std. Deviation	Min	Max	Mean	Std. Deviation	Min	Max
1. Students must be able to somehow organize the relationships that exist between their new and old knowledge	**4.55**	0.522	4	5	**4.64**	0.505	4	5
2. Students do learn in different ways but it is not really useful to try to translate their different learning profiles into classroom practice	**4.18**	0.874	2	5	**4.45**	0.522	4	5
4. The same basic principles apply to the learning of all children	**2.73**	1.272	1	5	**2.45**	0.934	1	4
5. Students have preferences for different ways of learning and teachers will be more effective, if they can offer those options to their students	**4.27**	0.467	4	5	**4.36**	1.206	1	5
6. Cultural diversity among students will lead to different interpretations of the same text	**4.00**	0.775	3	5	**4.36**	0.505	4	5

8. If no connection can be established between the new and already existing knowledge, then no meaning can be made for students, and thus very little is learned	**3.91**	1.044	2	5	**4.45**	0.688	3	5
9. The inclusion of different student interests is crucial to successful EFL learning	**4.45**	0.934	2	5	**4.27**	1.272	1	5
10. Student understanding is supported when students restructure meaning in a range of modalities, e.g. written and oral language, visual representations, gestural representations	**4.30**	1.252	1	5	**4.45**	1.214	1	5

Table 8.5. Results for questions that measure teacher's understanding of how different students learn before and after the intervention.

The comparative analysis shows teachers' increased understanding of students' different lifeworld experiences and the role they play in their learning through their answer to the question 'Cultural diversity among students will lead to different interpretations of the same text' (mean=4.00 before vs mean=4.36 after). Teachers also developed deeper understanding of meaningful learning principles relating to the importance of connecting prior to new knowledge and the importance of offering learners different options and modalities according to their preferences for effective learning. However, there were two surprising exceptions in the results concerning the questions 'The same basic principles apply to the learning of all children' and 'The inclusion of different student interests is crucial to successful EFL learning', where teachers' responses tended towards less open to diversity assumptions on how their students learn. This could be due to the phrasing of the questions where the use of the word 'same' in connection to DI and the exaggeration of the word 'crucial' may have been misleading to the teachers' understanding of the meaning of the questions. Overall, the analysis has shown that teacher understanding of how

different students learn deepened after EDIT contributing positively that way to teacher openness to diversity.

8.3.2. Quantitative and qualitative content analysis exploring teachers' developing openness to diversity after EDIT

This section presents the results of the quantitative and qualitative content analysis of the open-ended questions of the final questionnaire exploring teachers' perceptions of differentiated teaching and their learners after EDIT. It is the same set of questions that teachers answered before EDIT asking about their perception of DI importance for effective learning, how and what they differentiate, their perception of their role as teachers, and their perception of student students with different levels of achievement, i.e. struggling and advanced students, who are often stereotyped by teachers. The core theme emerging from the analysis of teachers' responses after EDIT could be succinctly described as *teachers assuming more responsibility for learners' learning,* characteristic of growth mindset classrooms and openness to diversity.

8.3.2.1. Teachers assuming more responsibility

The after EDIT quantitative and qualitative content analysis of teachers' answers to the question 'How important do you think differentiated instruction is for effective learning?' tracked a change in the majority of teachers' (8 teachers, 73% in 27 meaning units) answers, which were then underlain by deeper and more conscious differentiated teaching assumptions referring to some concrete learning conditions and processes. In more detail, almost half of teachers (6 teachers, 55% in 6 meaning units) perceived DI as instruction offering opportunities for effective learning and learner growth underlying a shift of focus from the image of 'teacher teaching' to that of 'learners learning'. For example, I2 wrote that DI is very important '(*b)ecause differentiated instruction caters for the needs, interests, level of all learners and can help each one of them reach their learning goals'.* Almost a quarter of teachers (4 teachers, 36% in 9 meaning units) described DI as the creation of appropriate learning

conditions such as meaningful learning, intrinsic motivation, and safe or good T-S relations within the classroom (see Appendix, Table 1, e.g. A1, C1, H2).

What is more, a few teachers (3 teachers, 27% with 12 meaning units) made an extensive reference to the teachers' role in DI exhibiting a deep understanding of DI, not as strategies and methods, but as teacher deliberate and accurate choices informed by their knowledge and continuous monitoring of student learning (see Appendix, Table 1, e.g. F2). For example, F2 wrote that DI is very important because '*DI proposes that the teacher is flexible and alert at all times. It is essential to be acquainted with new research, view things from different perspectives, respect the personality of each, comprehend the teaching setting and a number of things to take into account beforehand, along with be ready to adjust to any unexpected situation in class'.* Finally, less than half of teachers (4 teachers, 36% in 4 meaning units) described critically what they called 'traditional instruction' revealing a raised awareness of DI and traditional transmissive teaching as two distinct educational paradigms (see Appendix, Table 1, e.g. D1).

Accordingly, to the question 'Do you differentiate? If yes, could you specify how and/or what do you differentiate? If no, could you mention some of the main reasons for not differentiating?', after EDIT it is all teachers (11 teachers, 100%), who answered affirmatively. Interestingly, though, the greatest change pertains to qualitative change in the participant teachers' practices after EDIT towards more open to diversity teaching. In particular, after EDIT, the vast majority of teachers (10 teachers, 91% in 36 meaning units) described DI practices with a conscious focus on learning conditions and processes representative of a more open to diversity teaching and learning paradigm. In particular, after EDIT teachers reported differentiating taking the following steps, a) *providing variety to learners* through multimodality, offering choices and a variety of material making an explicit reference of their connection to learner needs (8 teachers, 73 %), b) *consciously thinking and planning* of learning (7 teachers, 64%), c*) differentiating content* (3 teachers, 27%), d) *creating the appropriate affective conditions* (2 teachers, 19%), e) *grouping learners* (2 teachers, 19%), f) *use of formative assessment* (1 teacher, 10%), and g) *openness to lesson*

adaptation (1 teachers, 10%). Nevertheless, a few teachers (3 teachers, 27% in 4 meaning units) even after EDIT referred to DI practices using externally and quantitatively focused criteria typical of transmissive teaching tradition such as the number of tasks students do, the time a task requires on the fixed weekly timetable, and teacher asking different questions to different students.

The quantitative and qualitative content analysis of teachers' answers to C2 question in the first and the final questionnaires asking them 'Write 5 words or expressions that come to your mind when asked to complete the sentence: My role as a teacher is….' revealed teacher developing openness to diversity after EDIT. In particular, from the great majority of teachers' descriptions (9 teachers, 82% in 29 meaning units) after EDIT, there emerged a changed perception of teaching as a process with teachers assuming greater responsibility for creating the appropriate learning conditions and believing more in their students' potential to grow. In particular, after EDIT the majority of teachers' descriptions (8 teachers, 73%) of their role gave emphasis to learning instead of teaching, i.e. describing a role of consciously creating the appropriate learning conditions and facilitating learning for learners. For example, H2 wrote '*My role as a teacher is to strive in order to help each student (struggling or advanced) to achieve his personal best, to provide engaging activities, to take into account each student's interests and instructional needs depending on his/her social and cultural background and abilities, to build a warm and happy environment where respect and trust preside, to help them learn how to use their knowledge and integrate it into their lives so they will be valuable members of society' .*

Half of teachers (6 teachers, 55%) after EDIT focused their attention to the learner referring to the learner needs and potential and taking active steps to empower and encourage their learning (see Appendix, Table 3, e.g. D1). For example, D1 wrote *'My role as a teacher is to facilitate learning for students, to shift from teaching to learning, to empower students in their learning, by giving them equal opportunities in the classroom for personal growth'.* It is also noticeable that after EDIT a few teachers' descriptions (4 teachers, 36%) revealed dialogic two-way interactions with their students where teachers were open to listen, embrace and openly communicate with

their students (see Appendix, Table 3, e.g. E1). On the opposite end, a few teachers' (see Appendix, Table 3, e.g. K2, J2).

8.3.2.2. Teachers' perception of learners: raised awareness of student diversity

Both before and after EDIT teachers wrote that they thought DI is important for effective learning using different aspects of learner diversity and subjectivity in their accounts such as different learner needs, levels of English, ways of learning, learner lifeworld and potential. It is just that the size of references made to these categories of learner diversity by a slightly larger number of teachers doubles after EDIT revealing teachers' raised awareness of student diversity. In particular, a meaning unit is defined as 'the constellation of words or statements that relate to the same central meaning' (Graneheim and Kundman, 2004, p.106). The number of meaning units, i.e. codes (16) devoted to descriptions of learner diversity by the vast majority of teachers (9 teachers, 82%) before EDIT increased after EDIT where all teachers (11 teachers, 100%) devoted a greater amount of meaning units (34) to descriptions of learner diversity. It is characteristic that before EDIT no reference is made by any teacher to a central DI concept of learner diversity, i.e. student interest, while after EDIT a quarter of the participant teachers (4 teachers, 36%) took learner interests into account in their descriptions of DI.

In the same line, the quantitative and qualitative content analysis of teachers' responses to the question, 'Do you differentiate? If yes, could you specify how and/or what do you differentiate? If no, could you mention some of the main reasons for not differentiating?', showed that before EDIT half of teachers (5 teachers, 45% in 7 meaning units) wrote about their DI practices taking into account learner diversity such as learners' different ability, language levels, interests, needs, and learning styles. In contrast, after EDIT it is the majority of teachers (7 teachers, 64% in 16 meaning units), who refer to learner diversity using the same categories. Interestingly, after EDIT there is a noticeable increase of teachers' reference to DI practices taking into account leaners' interests. Before EDIT it is only one teacher (1 teachers, 10%), who refers to student interests. In contrast, after EDIT half of teachers (5 teachers, 45%)

wrote that they differentiated by student interests, a characteristic of learner-autonomy supportive classrooms.

What is more, after EDIT, teachers refer to DI with respect to all student needs, not equating it with the needs of struggling students. Indeed, B1 consciously draws attention and corrects her stereotypical thinking of high achieving and less high achieving students, *'At least I try. I try to create differentiated lesson plans and to implement them "freely" in class. In saying freely I mean that I am always open to adapting my plan depending on the learners' interests. Of course, having said that I must point out that I teach at a model high school where students have a high level of knowledge already and are willing and open to new ideas, and most importantly discipline is not very often a problem. Just as I wrote down these words I feel the need to remind myself that when working in other schools in the past my students were always open to differentiated instruction and novelty. It was just a bit more difficult to create an environment of trust and make them realize that they were actually learning even if they felt comfortable and doing things that actually interested them'.*

Taking a closer look to teachers perceptions of students of different achievement, i.e. struggling and advanced students, the analysis revealed that after EDIT half of teachers (6 teachers, 55%) explained student differences making reference to learning conditions and few teachers (4 teachers, 36%) to inner learner subjectivity with a focus on students' different perspectives, such as learner perceptions and motives, i.e. showing that an understanding of others different perspective to the world is core for developing openness to diversity (see Appendix, Table 4, e.g. D1, G2). At the same time, half of teachers' descriptions (6 teachers, 55% in 11 meaning units) after EDIT focused on more inner and insightful learner differences than before EDIT such as their level of flexibility or their preferences for working alone, which were still, though, used in a generic manner as if characterizing the whole group of struggling and advanced students together with descriptions talking about student ability, a fixed-mindset concept. For example, F2 wrote that struggling and advanced share *'the unknown, new learning areas they have to discover and the support and encouragement they have got from family and school',* which is indeed an insightful observation

disregarding though the fact that not all students share the same support and encouragement from either their family or school.

These results reveal teacher change towards developing more open to diversity mindsets and possibly teachers' deeper understanding of their students in terms of the learning conditions and inner psychological processes, but with remaining stereotypical thinking of students overlooking individual differences. Overall, comparative analysis of teachers' answers to C1.a, question show a change from *fixed mindset-focused* (9 teachers, 82% in 18 meaning units) before EDIT to more *growth mindset-focused* (9 teachers, 82% in 10 meaning units) teacher descriptions after EDIT.

The results of the analysis of teachers' answers to C1.b asking them 'Write 3 words that come to your mind when asked to complete the sentence: b. The similarities between struggling and advanced students are …' are quite interesting. After EDIT the great majority of teachers (9 teachers, 82% in 20 meaning units) revealed an even greater degree of openness towards diversity than before EDIT as the size of meaning units after EDIT indicates, .e. they doubled from 10 to 20. In particular, the majority of teachers (7 teachers, 64% in 12 meaning units) described learner similarities in terms of inner learner subjectivity using more concrete, conscious and longer descriptions than before EDIT referring to the learners' need for acceptance, competence and belonging, feelings of fear and anxiety, learning styles, interests and learners' potential (see Appendix, Table 5, e.g. H2). Half of teachers (5 teachers, 46% in 7 meaning units) focused on the teaching context revealing a developing situational thinking, i.e. understanding learner subjectivity and diversity in terms of their context (see Appendix, Table 5, e.g. D1). At the same time, only one teacher (1 teacher, 10%) talked about student similarities in a stereotypical and fixed mindset manner focusing on learners' performance and behavior. It is J2 who wrote that the similarities between struggling and advanced students are 'rather subtle'.

The quantitative and qualitative content analysis of the question C1.c. focusing on teachers' greatest challenge in teaching struggling and advanced students showed that after EDIT the participant teachers assumed greater responsibility for struggling

students' learning. In particular, the majority of teachers' answers (7 teachers, 64% in 9 meaning units) focused on learning and their descriptions were more practice-focused with respect to how they could achieve that (see Appendix, Table 6, e.g. H2). For example, H2 wrote the greatest challenge in teaching struggling and advanced students was '*to achieve in getting their a) trust, by creating a safe atmosphere in class, b)interest/attention by designing a multimodal lesson so as to match the students' different learning styles'.* One third of teachers (4 teachers, 36% in 4 meaning units) in contrast to the majority of teachers (8 teachers, 73%) before EDIT, focused on the challenges of facilitating struggling students believe that they can learn (see Appendix, Table 6, e.g. I2). This decrease in the number of teachers perceiving students' beliefs in their potential as a challenge may be due to teachers' feeling more confident and/or knowledgeable after EDIT. It is also important to note that after EDIT teachers used more facilitative of student autonomy language such as the verb 'help them' in contrast to the more controlling language which was common before EDIT such as the use of the verb 'make them' (see Appendix, Table 6, e.g. A1)

Interestingly, though, after EDIT even fewer teachers focused on advanced learners' learning, possibly due to the teachers' tendency to focus mainly on struggling students, as it has already been indicated in previous sections of the analysis. In particular, only a few teachers' answers (3 teachers, 27% in 3 meaning units, in contrast to 6 teachers, 55% before EDIT) focused on advanced learners' learning. However, still their rationales were more eloquent, long and referring to particular processes and aims of autonomy-supportive learning revealing teachers' differential treatment to struggling students even after EDIT. For example, D1 wrote that the biggest challenge in teaching advanced students is '*to provide them opportunities to experience real challenge and help them advance at the level of their ability and this means designing lessons/tasks that allow for more accelerated learning, creative thinking, and planning interest-based projects', while for struggling 'to give them a practical and optimistic mindset coupled with strategies that will help them learn successfully'.* Instead, the great majority of teachers' descriptions (8 teachers, 73% in 13 meaning units) focused on how to intrinsically motivate and challenge advanced learners (see Appendix, Table 6, e.g. H2).

Finally, the analysis also showed that after EDIT half of the participant teachers' answers (5 teachers, 45% in 6 meaning units) focused on struggling students' needs, an analytical category that was absent before EDIT (see Appendix, Table 6, e.g A1, B1). After EDIT, this analytical category of the teachers' paying attention and referring to students' needs appeared in the teachers' descriptions of advanced learners as well. However, it is only a few teachers (2 teachers, 19% in 3 meaning units), who refer to advanced students' needs, i.e. again the number of teachers talking about the advanced learners' needs is smaller than the number of teachers' talking about struggling students' needs (see Appendix, Table 6, e.g. E1).

8.3.3. Teachers' self-reports of change after EDIT

This section presents the analysis of teachers' self-reporting accounts of the changes they have identified in the middle and the end of EDIT through their answers to the open-ended questions asking about the changes they identified a) in the way they perceived themselves as professional teachers (middle and end of EDIT), b) their understanding of their students (middle and end of EDIT), c) new skills or knowledge acquired during EDIT (middle of EDIT), d) in their practice/ life/ school context (middle of EDIT), and e) in their interaction with colleagues at school (end of EDIT). From the analysis, the following two main themes of teacher change emerged, a) openness to student diversity, and b) teaching practice changes.

8.3.3.1. Developing openness to student diversity in the middle and after EDIT

The first emergent theme from the qualitative content analysis of teachers' answers to the open-ended questions of the middle and the final questionnaires exploring teacher change relates to the participant teachers' developing openness to diversity constituting of: i) teachers' widened perception of student diversity, ii) teachers' developing growth mindset, iii) teachers' developing better teacher-student relationships, and iv) broader changes.

i. Teachers' widened perception of student diversity

The analysis of teachers' answers to B2 question in the middle and the end of EDIT asking them 'Has your understanding of your students changed in any way?' revealed that the vast majority of teachers (10 teachers, 91% in the middle of EDIT, 11 teachers 100% at the end of EDIT) answered affirmatively to the question. Half of teachers (6 teachers, 55% in the middle of EDIT, 5 teachers, 45% at the end of EDIT) used a positively emphatic language explicitly stating that their understanding of their students has changed during EDIT. For example, K2 in the middle of the program wrote "*(y)es, it has changed significantly. Now, I realize that what often passes as clownish or undisciplined behavior stems not necessarily from boredom but from insecurity and a fixed mindset*", while E1 in the middle said "*In many instances I realized how many single stories my brain was unconsciously filled with*" and at the end "*It has changed a lot*".

It is important to note that a few teachers (3 teachers, 27% in 3 meaning units) reported that well before EDIT they were trying to understand their students and some even felt close to them. For example, B1 wrote "*(a)lthough I have always tried to be open and approachable as a teacher, I feel that DI has helped me to be even more so, especially when confronted with lack of interest in a lesson that I have worked very hard on. I try to put my students' interests first but also take their different learning styles in mind*". This same teacher in the middle of EDIT also admitted that her feelings of failure in face of difficulties will never go away underlying a fixed teacher mindset, "*I usually blamed myself for the students' inappropriate behavior and felt I had failed. I still have the same feeling of failure and disappointment and I don't think that will ever go away.*

The qualitative analysis of the rationale of teachers' affirmative answers revealed that the great majority of teachers (9 teachers, 82% in 22 meaning units) started developing a more open to diversity frame of reference with teachers reporting the following changes in their understanding of their students, i) taking into account students' inner subjectivity, such as mindsets, interests and learning styles (7 teachers, 64%), ii)

developing situational thinking of diversity, i.e. understanding learners and learning in terms of the context (6 teachers, 55%), iii) developing a belief in student potential to grow (5 teachers, 45%), iv) developing better teacher-student relationships (3 teachers, 27%), v) becoming aware of their own stereotypes (3 teachers, 275) and vi) developing a more growth mindset about themselves (2 teachers, 19%).

For example, I2 taking into account students' mindsets reported at the end of the program "*I feel that I have become a bit more open-minded as far as the students' attitude towards learning is concerned. I try to keep their different mindsets and learning experiences in mind.*" On the other hand, F2 revealing her developed situational thinking wrote *"I may have become more sympathetic and patient at the hard times they are facing because I take into account all the various parameters that can affect the process of learning. Additionally I am more flexible at accepting different modes of expression of their responses"*. Finally, an example of some teachers' developing growth mindset and their belief in their own potential is H2, who wrote in the middle " *I have always been close to my students (at least most of them) but now I've learned a couple of things to approach them even more and help them overcome their difficulties"*.

The analysis of teachers' answers to the question, 'What are the changes Exploring DI Together has brought about in the way you perceive yourself as a professional teacher?', has shown that half of teachers' (6 teachers, 55% in 12 meaning units) accounts revealed changes in their attitude towards students (3 teachers, 27%), and a widened perception of student diversity (4 teachers, 36%), both characteristic changes of a more open to diversity frame of reference. For example, G2 in the middle of EDIT wrote *"I used to have the tendency to work less with or even ignore students who didn't speak a word of English and showed no interest in trying to learn. Now I realize that everyone can contribute in their own way if they are just given a chance to prove they are worth of something. I understand what big a mistake my attitude used to be and I have started to pay much more attention to "struggling" students"*. Similarly, E1 in the middle of EDIT admitted that the program widened her perception of student diversity saying *"(i)t has widened my perspective on students' different needs; I*

occasionally feel surprised by small things I am now able to see that earlier went unnoticed".

ii. Teachers' developing a growth mindset

The quantitative and qualitative content analysis of teachers' answers to the question 'What are the changes Exploring DI Together has brought about in the way you perceive yourself as a professional teacher?' has revealed that half of teachers (6 teachers, 55% in 8 meaning units) reported affective changes brought about by EDIT such as feeling more confident and becoming more growth mindset themselves. For example, D1 in the middle of EDIT indirectly reported her feelings of confidence saying that "*Exploring DI Together has brought added value… I think the more one develops his/her teaching abilities or knowledge, the more confident he/she can become in teaching. The more confident and experienced a teacher becomes, he/she feels he/she is ready to move to "the next level'' that of a teacher trainer or a mentor*". On the other hand, H2 in the middle of EDIT described her growth mindset change saying "*(t)he TED talks about vulnerability and shame were quite enlightening for me because I no longer feel disappointed in the face of failure since try is what really matters. I am ready to risk even if it might not have the desired result*".

With respect to the question asking about new skills acquired, teachers referred to more holistic changes. The majority of teachers' answers (7 teachers, 64% in 11 meaning units) revealed their developing openness to diversity with a prominent growth-mindset along the following categories i) becoming more patient towards students (5 teachers, 45%), ii) becoming more positive and encouraging indicating the development of a more growth mindset towards students (3 teachers, 27%) and iii) a positive change in their relationships with students (3 teachers, 27%). For example, C1 reported "*dealing with discipline problems with patience, resilience and more positive attitude and optimism*", while F2 said "*(m)y engagement in this process has helped me revitalize my learning skills because I also have to learn some new things and therefore feel empathy to my students and become sensitive to the difficulties they meet and I get in their shoes*".

iii. Teachers' developing better teacher-student relationships

The quantitative and qualitative content analysis of the question in the middle questionnaire asking teachers 'What difference has Exploring DI Together made to your practice/life/school context so far? What changes can you identify? Use the following questions as a guide to respond to the question above. Be as descriptive as possible and use specific instances' have shown that half of teachers (5 teachers, 45%) reported changes related to their developing openness to diversity. From the analysis there emerged the following categories of teacher change i) teacher attempts to include all students in learning (3 teachers, 27%), ii) their dialogic interaction with students and the development of students communicative competence (3 teachers, 27%), iii) the improvement of their relationship with their students (2 teachers, 19%), and iv) classroom management (1 teacher, 10%). For example, E1 wrote "*(i)In the instances of two students (one usually uncontrollably energetic and the other distant and isolated) getting rid of the 'single stories' I had constructed substantially helped me build a relationship with them*", while F2 admitted "*I 've urged students to developing critical thinking and self-assessment. I have always insisted that they express their ideas and   listen to others with respect.   Another major issue has been for me as a teacher how to handle students of different linguistic competencies in the same adolescent class. Lately I can tell there has been some improvement!*".

In a parallel line, the quantitative and qualitative content analysis of teachers' answers to the question in the middle and the final questionnaires asking them 'What are the changes Exploring DI Together has brought about in the way you perceive yourself as a professional teacher?' revealed that a quarter of teachers (4 teachers, 36%) reported becoming more competent with classroom relationships. For example, I2 in the middle of the program identified changes in the quality of her relationship with her students saying "*It hasn't changed my perception of myself as a teacher, but it has helped me be more tolerant and try to have better, more open relationship with my students*".

iv. Broader changes

The quantitative and qualitative content analysis of teachers' answers to the question in the middle of EDIT only asking them, 'Have you acquired any new skills or knowledge during Exploring DI Together? If yes, please describe', have shown that a few teachers (3 teachers, 27% in 3 meaning units) in their accounts talked about having been empowered for changes not only in their teaching but also their personal life and relationships. Their descriptions evoked a general feeling of positivity. For example, D1 wrote *"Exploring DI offers knowledge that can be used to enhance teaching practice. I found Dweck's mindset theory life inspiring and ground-breaking. This theory is not only applicable to students but also to teachers. Just as students work towards an open, positive and resilient approach to learning, teachers also have the opportunity to embrace a culture of positivity and praise within their classrooms. The growth mindset is a perspective that has empowered even me to view life and self differently as its implications are not only found on education but also on personal relationships."*

Finally, the analysis of the question at the final questionnaire, 'Have you observed any changes in the way you interact with your colleagues at school?', has revealed that a few teachers (3 teachers, 27% in 3 meaning units) answered affirmatively acknowledging that their interaction with their colleagues at school had changed, which actually suggests a more holistic change with respect to their openness to diversity and the way they understand and communicate with different others. For example, C1 wrote *"I've started to respect the "diversity" among my colleagues, their backgrounds, their needs and I realized how important is to establish a common basis/ ground for communication with everyone – more discussions based on the what I've learnt and experienced through the course. I reflect a lot on their opinions about intelligence, success & failure etc. The course has also influenced my perception of education as a whole. The way I see my own children's process and progress at school their "success" and failures" the stereotypes that have been haunting the education system for years"*.

Half of teachers (6 teachers, 55% in 6 meaning units) answered negatively to the question not seeing any changes after EDIT in the way they interacted with their colleagues at school. For example, F2 answering the question of whether she observed any changes, said "*(n)ot much. The ones that were keen on talking, we still do nicely so. The ones who didn't want to get involved in something new, hardly do they ever try. But when I undertake a project and I invite them to join in, few are happy to participate or at least take a timid look at it.*"

8.3.3.2. Teaching practice changes

The second emergent theme from teachers' self-reports refers to changes in their *t*eaching practice constitutive of the following elements, i) *c*hanges in their perception of teaching, ii) development of deep understandings about DI, and iii) changes in their classroom practices.

i.   Reported changes in teachers' perception of teaching

The quantitative and qualitative content analysis of teachers' answers to the question in the middle and the final questionnaires asking them 'What are the changes Exploring DI Together has brought about in the way you perceive yourself as a professional teacher?' has shown that the majority of teachers (7 teachers, 64% in 9 meaning units) in their descriptions reported changes in their perception of teaching. For example, K2 at the end of the program reported a change on the perception of her role as a teacher writing *"I do not perceive my personal role as that of just conveying knowledge but of helping my students realize that the only way to fulfill their potential is to put in a great deal of effort. No degree of talent is sufficient on its own.*" In a parallel manner, C1 at the end of the program talked about changes in her perception of standard teaching practices. She wrote, "*-reflecting and reconsidering a lot on standardized practices that often led to disillusionment in terms of student's progress, motivation, discipline, inclusion….it helped get over the feeling of professional breakdown*".

ii.   Reported development of teachers' learning

The quantitative and qualitative content analysis of teachers' answers to A4 question in the middle and the final questionnaires asking them 'What are the changes Exploring DI Together has brought about in the way you perceive yourself as a professional teacher?' has also shown that one third of teachers' accounts (4 teachers, 36% in 6 meaning units) described the development of deep understandings and becoming more knowledgeable. A characteristic example is that of D1 at the end of EDIT, who explicitly described her understandings developed during EDIT "*Exploring DI Together has helped me understand how important is high quality teaching. It is not teaching per se that counts but effective teaching not to mention student learning. Curriculum tells us what to teach: Differentiation tells us how. Learning by Design is another way of designing lessons that can help structure meaningful lessons can help students discover the answers to essential questions. More specifically, it helped me realize that is important to challenge my students and especially the gifted ones by structuring lessons i.e. Is this a post-truth society?   Or what is heritage? As a mentor it has helped me pass this knowledge and experience to pre-service/student teachers*".

Accordingly, the quantitative and qualitative content analysis of teachers' answers to the question in the middle of EDIT only asking them, 'Have you acquired any new skills or knowledge during Exploring DI Together? If yes, please describe', has shown that the majority of teachers (7 teachers, 64% in 11 meaning units) referred to the content knowledge of the 2nd cycle of EDIT and a few teachers (2 teachers, 19% in 2 meaning units) referred to the content knowledge of the 1st cycle of EDIT . In more detail, the new knowledge that teachers reported on acquiring during the 2nd cycle of EDIT involved knowledge about i) mindset theory and how intelligence changes (6 teachers, 55%), ii) neuroscience and how the brain learns (3 teachers, 27%), and iii) the concepts of shame and vulnerability (1 teacher, 10%), while 1st cycle knowledge referred to stereotypes and different perspectives (2 teachers, 19%) . For example, E1 said "*(o)f course; cycles 1 & 2 changed and enriched, to a considerable extend, the way I viewed education, knowledge and – eventually – life. It also gave me a better understanding*

of my students and their needs. I think the discussion on the nature of intelligence and the discussion on stereotypes were the ones that were mostly influential to me."

iii.   Reported changes in teachers' classroom practices

The quantitative and qualitative content analysis of teachers' answers to the question asking about the changes that EDIT brought about in the way they perceived themselves as professional teachers showed that the vast majority of teachers (10 teachers, 91% in 20 meaning units) reported changes in their classroom practices, which involved i) designing for meaningful learning (5 teachers, 45%), , iii), becoming more autonomy supportive through the provision of multimodal and other choices together with the cultivation of a growth mindset culture (4 teachers, 36%), and iv) experimenting with new practice (3 teachers, 27%). For example, G2 who at the end of EDIT wrote *"(t)he way I think has already changed, but acting needs more practice. These are the most important changes: Taking into consideration the different learning styles of students and offering lessons that cover different styles (with audio and visual material, [audio, visual, written, oral, groups, making artifacts, videos, written or oral work, work in groups or individually, theatrical plays] making artifacts, videos or theatrical plays) making connections between the new and previous knowledge and focusing on what is meaningful to students. Starting with an essential question and having answered the question of what I want my students to do with this knowledge beforehand. Recognizing and avoiding stereotypes"*.

Teachers answers to the question in the middle questionnaire asking about the difference that EDIT made to their practice/life/school context so far showed that half of teachers' descriptions (5 teachers, 45%) focused on the changes they identified in their teaching such as lesson planning, provision of feedback, the learning aims and tasks, or use of learner self-assessment. For example, C1 identified changes *"(i)n lesson planning, discussions, giving feedback, classroom management, learning tasks, trying to involve shy students without making them feel uncomfortable, trying to make everyone in class contribute to the lesson through encouragement and reward. In all classes I'm still trying to improve the way I give feedback considering the two mind set*

theory". Finally, one teacher (10%) wrote that it is too early to talk about implementing what she learned in EDIT, (K2) "*I think It is still too early to talk about how the newly acquired skills and outlook have been implemented in the school context*".

To the same question, half of teachers (6 teachers, 55% in 12 meaning units) referred to the extensive use they made of EDIT resources in their classrooms such as the videos, the theories, the questionnaires and the growth mindset protocol. A characteristic example is that of H2, who wrote "*I used products of the community in my B.2 classes this year. Certain pieces of the material provided in the platform (pictures, URL links, theories, questionnaires...) were used to get my students acquainted with meaningful information, motivate them and getting them interested in participating and eventually learning which (hopefully) will lead them to a change of attitude towards their life*".

The analysis of teachers' answers to the question in the middle and the end of EDIT asking them 'Has your understanding of your students changed in any way?' revealed that half of teachers (5 teachers, 45% in 5 meaning units) reported on changes in their teaching practice and learning concerning DI. For example, D1 wrote "*(b)oth the structure and the content of the workshop along with the differentiated instruction used in our training helped me gain valuable insight into DI and how important is to adjust the curriculum to the learners and not expect learners to modify themselves for the curriculum. Flexibility is an important skill and that we, as teachers, should not have stereotypes*". Finally, to the question asking them whether they have acquired any new skills or knowledge during EDIT, a few teachers (3 teachers, 27 % in 3 meaning units) referred to EDIT's contribution in the enhancement of their teaching practice. For example, K2 reported "*I have become more patient and encouraging. At the same time, I reflect on my teaching practice more often, trying to strike a balance between challenging tasks and tasks that are not too daunting for the students*".

8.4. Conclusion

In conclusion, from the quantitative and qualitative results of the analysis presented in this chapter, two main themes emerged pertaining to teachers' perceptions of learner diversity and their perceptions and practices of differentiated teaching. The first theme emerging from the analysis of teachers' responses *before EDIT* could be succinctly described as *non-openness to diversity with teachers putting the onus for learning on students,* characteristic of fixed mindset classrooms. In more detail, the participant teachers at the beginning of EDIT appeared to be inspired by humanistic teaching ideals acknowledging the importance of DI, and being aware to some extent of learner subjectivity, i.e. learner needs and inner psychological processes. However, their reported perceptions and practices were underlain by traditional linear transmissive and controlling teaching assumptions. In essence, the main assumption underlying their responses was a simplistic conception of teaching where learning and motivation happen automatically in the context of linear one-way teacher-student interactions assuming that the teacher directly causes learning by simply telling something to students, giving material and tasks to them, and making use of certain methods and tools. For decades instrumental rationality implicitly assumed that it is the strategies, the methods, the activities that cause learning (Cranton, 1996).

With respect to learners, the analysis of teachers' perceptions of the differences between struggling and advanced students revealed that the majority of teachers before EDIT focused on differences in learner motivation putting the onus for motivation on students perceiving motivation as a personal trait or focused on student achievement and performance tracking students by ability. Both of these foci are typical of *non-open to diversity thinking* underlay by a fixed-mindset*.* The analysis of the question, though, which brought to teachers' attention student similarities instead of differences revealed a certain degree of openness towards diversity before EDIT through descriptions of learners in terms of inner learner subjectivity such as needs, interests, need and willingness to learn with a few teachers showing situational thinking as well.

In accordance to teachers' non-openness to diversity before EDIT, the results of the question referring to the greatest challenge teachers faced with struggling and advanced students revealed teachers *differential treatment* of students of different

achievement levels in a fixed-mindset and stereotypical manner holding lower expectation for struggling learners and higher expectations for advanced learners. In essence, for struggling students they put the onus for their learning on them in a controlling and transmissive teaching manner, i.e. 'make them believe' and attempting to directly cause motivation to them. On the other hand, teachers assumed more responsibility for advanced students learning trying to create the appropriate conditions for learners by setting learning aims or trying to intrinsically motivate them by arousing their interest or challenging them.

The second theme emerging from the analysis of teachers' perceptions of DI, their DI practice, and their perception of their role as a teacher *after EDIT* could be succinctly described as *openness to diversity with teachers assuming more responsibility* for their learners' learning characteristic of more growth mindset classrooms. In more detail, after EDIT teachers' responses revealed a changed perception of teaching as a process with teachers assuming greater responsibility for making deliberate choices in order to create the appropriate learning conditions and believing more in their students' potential to grow. In parallel, teacher-student interaction became more dialogic, i.e teachers appeared more open to listen to their students' voice, to embrace them and openly communicate with them - not just 'teach' them.

With respect to learners, after EDIT teachers' responses were revealing of their assuming more responsibility explaining student differences with reference to learning conditions and inner learner subjectivity focusing on more inner and insightful learner differences than before EDIT. These foci are typical of an *open to diversity thinking* underlay by a growth mindset. At the same time, bringing to teachers' attention student similarities, revealed an even greater degree of openness towards diversity for the great majority with more teachers revealing a developing situational thinking, i.e. understanding learner subjectivity and diversity in terms of their context.

 In accordance to teachers' developing openness to diversity after EDIT, the results of the question referring to the greatest challenge teachers faced with struggling and advanced students revealed that teachers assumed greater responsibility for

struggling students' learning, while there was a decrease in the number of teachers who perceived students' beliefs in their potential as a challenge possibly due to their feeling more confident and assuming greater responsibility themselves. At the same time, teachers' responses revealed greater attention paid to their learners and their needs together with a more holistic understanding of student diversity in terms of their inner psychological processes and their context, both indicators of an open to diversity and growth mindset. Nevertheless, teachers' differential treatment of their students persisted with fewer teachers focusing on advanced learners' learning after EDIT focusing mainly on how to intrinsically motivate and challenge them but with using still more eloquent and long descriptions referring to particular processes and aims of autonomy-supportive learning in comparison to struggling students learning. What is more, the number of teachers talking about the advanced learners' needs is smaller than the number of teachers' talking about struggling students' needs.

In accordance, to the emergent theme of developing openness to diversity after EDIT, the analysis of teachers' self-reports on changes they perceived coincides with teachers own accounts which acknowledge change after EDIT towards a) a developing openness to diversity with teachers, widened perception of student diversity, their developing growth mindset believing in their student potential to grow but also they themselves feeling more confident to have an impact on them, the development of better teacher-student relationships and, finally, broader changes relating to their personal life as well and the way they communicate with different others, and b) changes in their teaching practice reflected in their reported changes perception of teaching, their development of deep understandings concerning DI and changes in their classroom practices such as designing for meaningful learning, becoming more autonomy supportive through the provision of multimodal and other choices, provision of feedback, the learning aims they set and the tasks they designed, and use of learner self-assessment, etc.

Indeed, the following chapter triangulates teachers reported changes in their teaching practice by presenting the results of the participant teachers' learning element

analysis before and after EDIT so as to track any teacher change and development in their ability to design high quality differentiated learning elements.

Chapter 9
Teacher Learning Elements' Analysis

9.1. Introduction

This chapter answers the third research question, 'What effect has EDIT had on teachers' ability to design high quality differentiated learning elements?' by presenting the results of the analysis of teachers' learning elements before and after EDIT. The analysis results presented in this chapter compare and contrast the first learning element that teachers designed at the beginning of the 3rd LbD cycle (from now on referred to as before EDIT intervention) before being exposed to the design principles of high-quality differentiated learning elements, and their final learning element designed at the end of the 4th LbD cycle (from now on referred to as after EDIT). The purpose of the analysis is to track any teacher change and development in their ability to design high quality differentiated learning elements in accordance to the scheme of predetermined criteria as they were developed based on the theoretical part of the study (see Chapter 4).

9.2. The cases of eight EFL teachers: comparing change before and after EDIT

What follows is the presentation of 8 teacher cases – 3 teacher cases were not included because these teachers (A1, E2, J2) did not submit either the before or the after EDIT learning element due to their work overload at the time so no comparison was possible for tracking change. It is important to note that in the analysis different DI criteria overlapped referring to the same pieces of data since a particular learning element trait could serve multiple DI functions. For example, the use of open-ended tasks served both to welcome learner lifeworld into the learning process and cultivate learner autonomy. It is also important to acknowledge beforehand some situational differences of the teachers' learning elements before and after EDIT, which have had an impact in the end result and became obvious in their comparison as by default differences of the quality of the two designs.

Firstly, all of the before learning elements are forty-five minute (45') learning elements according to the EDIT task, where the teachers had been asked to represent in the form of a learning element any *one* of their teaching hours of the Think Teen state book. In contrast, the after EDIT learning elements are longer learning elements extending over more than one teaching hours following the principles of the LbD and meaningful learning design, where there are no time restrictions. Secondly, there was no specification set to teachers to design learning elements for the same language level before and after EDIT since it was assumed that the design principles that teachers follow are independent from the language level of their students. This variance at the levels, however, had an effect to the differences found between the learning elements of different language proficiency levels before and after EDIT.

9.2.1. The case of B1 teacher

B1 is an EFL secondary school teacher teaching at a Greek Experimental Junior High School. Her first learning element, before EDIT, was based on the Beginner's version of the 1st grade Think Teen school book, and, in particular, Unit 7 entitled 'In our mind's eye!', Lesson 2 entitled 'Houston, we're back!', page 97 (see Appendix 13). The learning element was for 2 teaching hours and had the following aims:

- *To develop students' speaking and reading skills*
- *To encourage students to do research*
- *To develop students creative writing skills / story writing / use of past tenses*
- *To encourage teamwork.*

It was a lesson about space travels, whose core reading text refers to Neil Armstrong's walk on the moon in 1969. Nevertheless, the teacher had chosen her own material based on the same topic, i.e. a short reading text with some biographical information about Neil Armstrong, two short reading texts entitled 'Moon trips' and 'Curiosity', and two short YouTube videos about how to do things in space. The lesson started with student brainstorming space related English language vocabulary to move on to reading the three texts and answer the reading comprehension questions. It set for homework the following two activities, a) to 'find information on Buzz Aldrin in groups' with the aim of presenting that information in class and b) 'write the names of the

planets in English in their order from the Sun' and memorize it. In the following lesson, students presented their Buzz Aldrin projects and were asked to write a story with protagonists the planets in the right order from the Sun:

> ***In groups or pairs:*** *write a story with protagonists the planets, referring to them in their order from the Sun. When you have finished your story you should be able to remember its plot that you will be able to recall all the planets in the right order.*

On the other end, B1's final EDIT learning element was not based on the schoolbook (see Appendix 20). Instead, in the context of EDIT she chose to plan a lesson on the occasion of a temporary exhibition about Van Gogh taking place at the time at Megaron Mousikis so as to prepare her students for a real life visit there. The teacher did not specify in her learning element the grade or the language level of her students. The learning element followed the adapted LbD rationale setting the following essential questions:

- *What does a piece of art reveal about the artist?*
- *What inner and outer factors influence an artist's work?*
- *How are we affected by a work of art?*

The learning element starts with students trying to figure out the meaning of the expression 'the artist's eye' followed by a series of pictures of Van Gogh's paintings and questions about students' knowledge of the artist, his art and art in general. Then, students listen to the song, 'Starry, starry night' expressing their feelings and drawing connections to the painter's work and character while completing a relevant chart, which helps organize and visually depict students' answers. Then, students watch a short video from the film 'Dreams' by Akira Kurosawa and a second YouTube video about Van Gogh with the aim to 'meet Van Gogh in person'. Next, they read a short biography of the artist completing a diagram with different boxes, which again help learners organize information both conceptually and visually. To complete all the boxes the students are asked to do their own research as well keeping track of their various sources and present it to their fellow students in the school blog. Then,

students are asked to read excerpts from Van Gogh's letters to his brother and sister and draw connections to some of his paintings justifying their answers. The final two activities ask from learners to look at everyday people around them while answering a number of questions, and then paint their own self-portraits by filling in the gaps in a poem about themselves, take a selfie or make a painting and create a poster attaching them to the poem.

Overall, the comparative analysis of the two learning elements using the criteria developed in the study has shown that B1's before EDIT learning element is a semi-coherent, learner irrelevant learning element building on knowledge acquisition with minor attempts to differentiation, while after EDIT, B1's lesson designing reveals a differentiated, coherent, semi-learner relevant learning element building on learner understanding (see Table 9.1.). Changes were observed in all of the DI learning element criteria. What follows is a more detailed presentation of the analysis results.

9.2.1.1. Before EDIT Analysis: *Space exploration*

i.   Semi-coherent

The analysis has shown that B1's before EDIT learning element, which is not based on the schoolbook but wholly planned and resourced by the teacher, is a semi-coherent learning element. It focuses on the topic of space exploration but it sets no relevant understanding aims with respect to essential topic concepts and knowledge. Instead, it sets a) some general language skill aims for speaking and reading development, b) a more specific one for writing a story using the past tenses, c) a social aim for encouraging teamwork and d) a learner autonomy one for encouraging students to do research. The learning element begins with the activation of learners' prior vocabulary knowledge on the topic through a brainstorming activity and a spidergram, while the progression of the activities is logical. The three reading texts on Neil Armostrong, moontrips and curiosity are followed by reading comprehension exercises. The central text on Neil Armstrong is also followed by some vocabulary explanation from the teacher and a discussion on what they already knew and what they learnt from

reading the text. The reading tasks are then logically sequenced by two YouTube videos on how to do things in space, and homework.

The only problem with the progression of the activities is that the information on the reading texts and the videos is disparate information about space related topics, not connected by a central main idea or concept, which subtracts from lesson's overall coherence since it does not scaffold learner understanding of the topic at some depth and add meaning to the language learning activities. "And the coherence comes from paying attention to the big ideas that underpin each curriculum area" (Myatt, 2018, p.36). In a similar fashion, the last activity referring to the memorization of the planets in the right order from the Sun is not aligned with any of the stated aims, and it is unconnected to any of the previous reading activities.

ii.   Learner Irrelevant

With respect to differentiation, B1's before EDIT design could be characterized as a 'learner irrelevant' learning element. The learning element attempts to activate learners' prior space-related vocabulary knowledge through a brainstorming activity (Part A, Lead in) but it makes no attempt to connect any prior and relevant experiences and/or interests of the learners' lifeworld with the lesson's learning. In essence, this activity is used as a recalling task drawing no connection between the words to facilitate learner construction of meaning. What is more, all of the learning element's tasks are closed-ended tasks, which leave no room for welcoming learner interests, perspectives, etc into learning.

iii.   Building on Knowledge Acquisition

B1 before EDIT learning element mainly aims to develop reading skills despite centering around a topic, that of space explorations since there are no explicit any

BEFORE EDIT	AFTER EDIT
LOW INTELLECTUAL QUALITY	**HIGH INTELLECTUAL QUALITY**
Semi-coherent • general language skill development aims • activation of learners' prior vocabulary knowledge • semi logical progression of activities: pre-reading, reading, watching videos, project, writing • outcome unconnected to the objectives	**Coherent** • essential questions • LbD logical progression of activities creating a unified whole • Essential questions answered
Learner Irrelevant ✓ closed-ended tasks aiming to get content 'right'; give one right answer	**Semi Learner Relevant** • open-ended tasks involving learner interests, experiences, feelings, perspectives, etc • it starts with prior learner knowledge with respect to new learning (not learner lifeworld such as prior experiences, interests, etc) • transfer to real life
Building on Knowledge Acquisition • work-focused; purposeless doing of exercises • factual knowledge only; isolated bits of info	**Building Understanding** • concept-based • it draws interconnections between concepts as part of a coherent whole • higher-order thinking • *conceptualizing, analysing applying*
DIFFERENTIATED	**DIFFERENTIATED**
	Providing a variety of Learning Styles *experiencing, reflecting, thinking, acting*
Multimodal learner Intput Visual	**Multimodal learner Intput & Output:** • Visual: pics, videos • Audio: song • Tactile-spatial: paint, photos attached, poster • Self: selfie
Learning with Others Providing opportunities to collaborate & negotiate in pairs & in groups	**Learning with Others** Providing opportunities to collaborate & observe people around them in real life
Fostering Learner Autonomy Encouraging learners to do own research	

Table 9.1. B1's learning element main changes before and after EDIT

connections drawn among the various tasks resulting in learner doing of exercises one after another. The design clearly makes no attempt to build student understanding on particular topic other than presenting disperse information relevant to space explorations such as the unconnected information on the two astronauts, Neil Armstrong and Buzz Aldrin, or learning the names of the planet in the right order. That way, learners are not facilitated to construct meaning but acquire isolated bits of knowledge. The learners are simply invited to give the 'right' answer in a number of closed-ended questions. Overall, such lower-order thinking processes as memorization of the right order of the planets or identification of the right answer in the reading comprehension questions constitute a not challenging enough learning element.

iv.   Differentiation

B1's learning element attempts to offer learners a limited variety of learning pathways. It involves them in a visual experience of meaning making by asking them to watch two short YouTube videos about how to do things in space (Part C) and offers learners a social learning pathway giving them various opportunities to collaborate and negotiate in pairs and in groups (Part A.B and Part D). In addition, it supports learners' autonomy by encouraging learners to do their own research finding information about Buzz Aldrin and present it in class.

9.2.1.2. After EDIT Analysis: *The artist's eye*

i.   Coherent

The analysis revealed that B1's after EDIT learning element is a quite coherent LbD learning element built around three essential questions. The essential questions manage to set a clear meaningful and pivotal understanding aim for learners, even though there are no other more specific understanding and language learning objectives written specifying what the learners should be able to do or know by the end of the lesson. The whole after EDIT LbD- learning element is coherently built

around the essential questions with each task building on the previous one and helping learners draw connections between the learning element's concepts, i.e. Van Gogh character, biography, his paintings, the feelings these paintings evoke to them, and their own self-portraits, making a quite holistic whole. It is interesting how the teacher attempts to build transfer of learners' learning at the final, Apply Creatively tasks, by drawing their attention to people around them and, then, their own self by making their self-portrait the way Van Gogh drew his.

ii. Semi Learner Relevant

The after EDIT learning element could be characterized as a 'semi learner relevant' learning element. In more detail, this is a learning element whose understandings reached by learners can transfer to their real life context through their visit to Van Gogh's exhibition. What is more, the inclusion of some open-ended questions welcoming learners' prior knowledge, opinion and feelings into the learning process add personal meaning to their learning. A characteristic example is when learners are invited to reflect on their feelings and answer the question 'How do you feel when you hear this song?' after listening to the song 'Starry starry night', an entry point for all to express their affect, while the teacher invited students to reflect on their feelings

On the other hand, it makes no attempt to connect learners' prior and relevant lifeworld experiences with new learning, when it begins with the open-ended question, 'What do we mean when we say the "artist's eye"?', which mainly invites learners' intellectual thinking, and not any relevant real-life experiences. In addition, it includes some closed-ended tasks as well giving priority to learners' giving one 'right' answer. A characteristic such example is the final learning element activity, a supposedly applying creatively activity, which asks teachers to paint their own self-portrait in the form of a poem, which would naturally invite learner creativity. Instead, this is a closed-ended task with a 'fill in the gaps' structure where learners were invited to fill in the gaps with their own words.

iii. Building Understanding

This learning element in contrast to the before EDIT design focuses on learner understanding, and, in particular, understanding the connection between a piece of art and its artist using Van Gogh and his work as a focal point. And it achieves this by drawing interconnections between Van Gogh's work and information about his life helping learners reach deep understandings of the topic through the medium of EFL in a focused and suitably challenging journey of learner understanding through a series of LbD higher-order thinking processes of conceptualizing and analyzing mainly. At the same time, learners are involved in language skill development through meaningful language usage such as negotiating with others and input of a wide range of reading texts, watching videos and listening to a song.

iv. Differentiated

B1's after EDIT learning element is effectively differentiated using a variety of learning styles such as allowing learners to experience knowledge, think, act on it and self-reflect. For example, the Applying Functionally section invites students to experience meeting Van Gogh 'in person' through film watching (Experiencing the new, 1.a). That way, the learners are also involved in multimodal learning experiences of visual and audio learning modes which are further enriched by spatial learning through the use of diagrams and tables helping them organize knowledge in a schematical way, or tactile learning experiences such as painting their own self-portraits or taking a elfie and making a poster. With respect to learner autonomy cultivation, learners are involved in some self-reflective experiences. Nevertheless, learner autonomy is no further cultivated. For example, there are no learner options or opportunities offered to express and connect their own interests and experiences with new learning.

The after-EDIT design also offers opportunities for some type of social learning with others, the way the before-EDIT design did. For example, at the beginning of the lesson, learners are involved in playing a game with their partner so as to write the titles of Van Gogh's paintings with the pair to finish first to win. In reality, such collaborative activities do not contain any authentic learner lifeworld sharing or co-

creation, where negotiation of different learner perspectives is required, making learning more relevant. It is important to note, though, that one of the final tasks asking learners to Apply Creatively the understandings reached during the lesson and observe people around them in their real life context involved learners in important social learning, i.e. openness to diversity, through reflecting on and better understanding others:

> *Look at every day people around you. Who stands out for you? Keep notes and write a short paragraph of their physical appearance but also of what they are doing. Why did you choose this person to write about? What feeling does this person evoke?*

9.2.2. The case C1 teacher

C1 is an EFL secondary school teacher teaching at a Greek Experimental Junior High School. Her first learning element, before EDIT, is based on the Advanced level version of the 2nd grade Think Teen school book, and, in particular, Unit 4 entitled 'Let's change our schools', Lesson 10 entitled 'Looking at other schools', pages 66-67 (see Appendix 14). The level of the students is B1+ while the learning element is for 45 minute with the following aims and objectives:

- *To develop fluency through a range of speaking activities*
- *To expand school / education related vocabulary*
- *To improve students' reading skills*
- *To help students produce meaningful spoken and written discourse*
- *To introduce authentic, motivating reading in class*
- *To raise intercultural awareness*
- *To help students express their views on education and school reality*

It is a lesson on the topic of education, and more specifically it involves students in a comparison of their own school with a school from Finland, to which the main reading text refers. Nevertheless, the teacher like B1 has chosen her own material based on the same topic, i.e. a reading text about Summerhill School, a fictional school from

A.S. Neil's book 'Summerhill School'. The lesson starts by asking students to make a list of at least three things that make their life at school difficult, and what they would change about it. Then, follows the reading of the text and answering some closed reading comprehension questions, followed by two open-ended questions such as writing the things that mostly impressed them about Summerhill school and then evaluate it and say if they think it is a good school and why. The last activity is writing an article for the school blog entitled 'An ideal school' describing the school of their dreams.

On the other hand, C1's final after EDIT learning element like B1's after EDIT learning element is not based on the school book (see Appendix 21). Instead, C1 chose to design a learning element entitled 'Why do people migrate?', on an up to date social issue, which was very controversial at the time in Greece, due to a great number of refugees crossing the Greek borders seeking asylum or better living conditions. The learning element is designed to be taught in 3 to 4 teaching periods while the teacher does not specify either the grade or the language level of her students. The learning element follows the LbD rationale asking a core essential question, 'Why do people migrate?' complemented by a number of different aims and objectives. It is important to note that the lesson plan includes no language learning aims or objectives but the language is used merely as a means for understanding content:

AIMS:

- *To raise students' awareness of global issues*
- *To bring the real world in the curriculum*
- *To prepare students for global citizenship*
- *To promote respect for human rights*

OBJECTIVES:

To help students:

- *have a deeper understanding of themselves and the reality around them*
- *become globally and socially aware citizens*
- *have a deeper understanding of the reasons that urge people to emigrate*
- *appreciate and respect cultural diversity*
- *relate history with cultural attributes*

- *get in contact & appreciate art*

The learning element rationale is caught up in the phrase *'Talking about the past is the best way to understand the present and approach our future..'*. The learning element activities revolve around the short movie "Ellis" (2015) by JR starring Robert de Niro, the website of the Statue of Liberty – Ellis Island Foundation and a BBC article. It follows an LbD structure. The learning element starts by asking learners of their own experiences and knowledge related to people having emigrated to a foreign country and then rank in order of importance the reasons that make people migrate. Then, students are asked to explore Ellis island by browsing its website with an article and some videos and then answer some closed-ended questions facilitating their understanding. Next, students are asked to compare and contrast the reasons why people immigrated in the USA in the 19th century with why people immigrate to Europe nowadays, write the advantages and disadvantages for the host and the home countries by completing some diagrams. There is an optional task informing students that they could read a BBC article to compare and contrast its information with their own ideas on the previous tasks. Part 1 finishes with students filling in a table with immigration related vocabulary and its definitions.

Part 2 starts by asking students a hypothetical question imagining what they would take with them if they had to leave their country. Then students are divided into four jigsaw groups, where each group has to answer one particular question while watching the movie 'Ellis' and, then, share with others. Three open-ended questions, like 'what would you do if you were the hero of Ellis island?' are supposed to be answered by all four groups. Part 2 goes on with students writing a review of the film discussing the film features such as acting, scenery, music, direction, etc with the help of a table listing all these film characteristics and a like and dislike column next to each. Then students are asked to write a poem with the acrostat 'immigration' or choose to write a story imagining they are one of the people on Ellis island.

Overall, the analysis has shown that C1's before EDIT learning element at the beginning of the 3rd cycle is a mainly undifferentiated coherent, learner relevant

learning element, which builds partially on learner understanding. In contrast, after EDIT C1's learning element changes into a differentiated, coherent, learner relevant learning element building on learner understanding (see Table 9.2.). Changes were observed in all of the DI lesson plan criteria. What follows is a more detailed presentation of the analysis results.

9.2.2.1. Before EDIT Analysis: *Education*

i. Coherent

The analysis has shown that C1's before EDIT the learning element, which was wholly planned and resourced by the teacher, is a coherent learning element. It specifies a) a concrete language objective of expanding 'school/education related vocabulary', b) some general language skills development aims such as 'to improve students' reading skills', and c) other aims relating to learners' intercultural awareness, motivation and student autonomy such as '(t)o help students express their views on education and school reality'. The learning element starts by attempting to draw links between learners' prior experiences with education, ie. their life at school, and the learning element's content. It has a clear structure following a logical foreign language skills-based sequence of pre-reading, while-reading and post-reading activities (Hedge, 2000) built around the core concept of an 'ideal school'. This traditional but clear EFL structure contributes greatly to the lesson's coherence. According to Seidel et al. (2005, p.543) clarity and coherence of lessons provide an important scaffold to student learning since '(a) clear and coherent lesson structure offers students more chances to keep track'.

ii. Learner Relevant

With respect to learner relevancy, the before EDIT learning element could be characterized a 'learner relevant' learning element. C1 attempts to connect learners' prior experience of school life with the main reading text about 'Summerhill School' by asking them at the very beginning as a 'warm up' to *make a list of at least three*

things that make your life at school difficult. What would you like to be different? If

you could what would you change about your school?

BEFORE EDIT*i*	AFTER EDIT
MEDIUM INTELLECTUAL QUALITY	**HIGH INTELLECTUAL QUALITY**
Coherent • concrete language & understanding objectives on what students are expected to do or know by the end of the lesson • logical progression of activities: pre-reading, reading, post-reading	**Coherent** • essential questions • logical LbD progression of activities creating a unified whole • essential questions answered
Learner Relevant • attempt to connect learner lifeworld (i.e. prior learner experience, interests) with new learning • some open-ended tasks involving learner interests, experiences, feelings, perspectives, etc • attempt to transfer	**Learner Relevant** • it starts by connecting learner lifeworld (i.e. prior learner experience, interests) with new learning • open-ended tasks involving learner interests, experiences, feelings, perspectives, etc • transfer to real life
Building Partial Understanding • concept-based • not drawing Interconnections • lower-order thinking *identifying, describing*	**Building Understanding** • concept-based • it draws interconnections between concepts as part of a coherent whole • higher-order thinking • *conceptualizing, analysing* ○ *applying*
UNDIFFERENTIATED	**DIFFERENTIATED**
Use of One Learning Style (thinking, reflecting)	**Providing a variety of Learning Styles** *thinking, reflecting*
	Multimodal learner Intput & Processing: • *Visual*: videos, sites, film • *Spatial*: diagrams
	Providing Multiple Foreign Language Readiness Options: *opportunity to choose between story writing or writing an acrostat poem*
Fostering Learner Autonomy: *provision of self-reflection opportunities*	**Fostering Learner Autonomy:** *provision of options & self-reflection opportunities*
	Fostering Learning with Others (jigsaw groupwork)

Table 9.2. C1's learning element main changes before and after EDIT

The rest of the learning element includes two open-ended questions welcoming learner feelings and opinion about Summerhill School, while the lesson design makes an attempt to transfer the final writing activity to students' real life by setting students' article writing in the context of their school blog.

iii. Building Partial Understanding

The focal point of the lesson becomes the reading text of a supposedly ideal school, 'Summerhill school' drawing no interconnections with other concepts as part of a coherent whole so as to develop learners' understanding of the concept of an 'ideal school', its different constituents, their interrelations and their connection to their own school. As a result, the design is not challenging enough involving learners mainly in lower-order thinking processes such as the identification of the correct reading comprehension answer (Activities B1 and A). Likewise, the final follow-up task asking learners' to write an article about their 'ideal school', again restricts student thinking to a descriptive level of each student identifying the characteristics of an ideal school.

iv. Undifferentiated

C1's before EDIT learning element is a mainly undifferentiated design using a single modality, i.e. the written-linguistic mode. At the same time, it involves learners in no kind of social learning with others through sharing, collaboration or co-creation of any type. In addition, it provides no variability for different foreign language levels and makes no use of any DI strategy. The only differentiated quality of the design is the inclusion of self- reflection opportunities both as a way to cultivate learner autonomy and as a way to offer another learning style apart from thinking.

9.2.2.2. After EDIT Analysis: *Why do people migrate?*

i. Coherent

C1's after EDIT learning element is a highly coherent learning element with a well-articulated rationale at the beginning built around a core essential question, 'Why do people migrate?', which sets the tone for the learning element's objectives. This time the to be different? If you could what would you change about your school? specifies no particular language objectives. Instead, English language skill development such as reading, speaking, i.e. negotiating, listening, i.e. watching videos, writing and vocabulary work is achieved through learners' involvement in a range of meaningful language experiences, which serve the lessons' main deep understanding aim, i.e. 'why people migrate?'. In essence, C1's after EDIT learning element sets some general intercultural and global citizenship awareness development drawing connections with the subject of history, i.e. exploring reasons why people migrated in the past, and art, i.e. films. In comparison to C1's before EDIT intercultural awareness aims, this time are more conscious and well aligned with the lesson content and tasks.

The progression of the activities is coherent and logical following an explicit LbD structure and building on each other while they facilitate learners draw connections and organize knowledge of the causes of immigration at present and in the past, the advantages and disadvantages for the host and the home country, the effect on people's personal lives, and how all these are depicted through films. It is important to note, though, that one of the last Apply Appropriatley activities, asking from students to discuss the film features such as scenery, music, direction, editing of the short film "Ellis" (2015) by JR that they had just watched, is a bit incongruous with the rest of the learning element since there is no previous built up on those concepts.

ii.   Learner Relevant

The analysis has showed that C1's after EDIT LbD learning element is highly relevant to the learners due to, firstly, effectively connecting learners' prior knowledge and experience with the lesson knowledge. The first experiencing the known task (Activity

1.1) welcomes into the lesson the learners' own real-world experiences with emigration into learning starting with a series of open-ended questions leaving learners the space and time to think. Secondly, the great majority of the lesson's tasks are open-ended involving again learner experiences, perspectives and feelings into learning. For example, Activity 1.6 asks learners 'What are the advantages and disadvantages of immigration for the host (destination) country, in your opinion?' or Activity 3.1 where the learners after watching the short film 'Ellis' (2015) are invited to also comment on the aspects of the film that they didn't like.

iii.   Building Learner Understanding

C1's after EDIT learning element has a clear focus on understanding involving learners in meaningful language learning experiences. It is built around the concepts of emigration and cultural diversity attempting throughout the lesson to draw interconnections between the concepts as part of a coherent whole so as to help learners reach deep understandings in a series of tasks based on LbD knowledge processes. In particular, the design starts with learners' own experiences and knowledge related to people having emigrated to a foreign country and goes on to build learner's understanding of the causes of emigration and the effects in the form of advantages and disadvantages in both the host and the home country. It is important to note that the teacher includes in her design lots of different perspectives using English as a medium, i.e. the emigrant, the host, the home country, building gradually learners' openness to diversity. She then helps learners further understand the connections that exist between the past and the present in terms of people leaving their countries. The analysis has also showed that the design is suitably challenging for learners involving them in higher-order thinking such as comparing and contrasting (Activity 1.5), finding similarities and differences (Activity 1.6), analysing critically (e.g. Activity 2.5), applying creatively (Activity 3.3).

iv.   Differentiated

C1's after EDIT LbD learning element is a mainly differentiated learning element. In particular,

a) it employs various learning styles such as thinking and reflecting where learners are asked to reflect on any prior emigration experiences of their lifeworld.

b) it also makes use of other modalities apart from the written-linguistic such as the visual with the use of videos, sites, and a short film, and the spatial with the use of diagrams to organize information.

c) the design also gives learners options facilitating learner autonomy, without though leaving much space for the inclusion of learner interests.

d) The applying creatively stage (Activities 3.2 and 3.3) gives learners the opportunity to choose between story writing or writing an acrostat poem, which are at the same time two different foreign language readiness options.

e) the learning element creates opportunities for social learning with others. A characteristic activity using a differentiation strategy is the jigsaw groupwork (Activities 2.2 to 2.8), where learners are given the opportunity to collaborate, share feelings, etc.

9.2.3. The case of D1 teacher

D1 is an EFL secondary school teacher teaching at a Greek Experimental Junior High School. Her first learning element, before EDIT, was based on the Beginner's version of the 2nd grade Think Teen school book, and, in particular, Unit 6 entitled 'What a waste!', Lesson 1 entitled 'Rubbish and pollution', page 64-65 (see Appendix 14). It was a 45 minute learning element. The level of the students it referred to is B1, age 13 and it stated the following *aims and objectives:*

By the end of this lesson, students will be able:

- *to predict key points of information in a text*

- *to find solutions in a text*

- *to write a short informal letter on an environmental problem they face in the urban area they live*

It was a lesson about pollution and waste. The teacher built her learning element around the three reading texts of the schoolbook, which referred to the letters written by three teenagers to the local newspaper about problems caused by pollution and litter in their area. The learning element followed the following book structure: Step 1 (Lead-in or pre-reading activities), Step 2 (Reading), Step 3 (Follow-up activity). It started by asking students to do Pre-reading Task 1, page 64 and read three statements about some environmental problems (rubbish, air pollution, litter), discuss their meaning and whether they felt surprised or not and why. Then followed Pre-reading Task 2, page, 65 where students read some statements and said whether they thought they were true or false and why, knowing that the answers would be found in the reading text to follow. A short discussion on the ideas mentioned in the statements followed referring to solutions to the problem of pollution. Students were then asked of their personal experiences with any of these environmental problems and read the three letters written by the teenagers. The class was divided into three groups. Each group read a different letter and shared with the others the correct answer to the task 2. The lesson finished with a short class discussion on whether the solution proposed in the texts, i.e. paying a fine, was an effective solution to environmental problems in urban areas, and then students were asked to use the texts in the book as a model to write their own short letter to appear in the school magazine about the most important environmental problem their neighborhood faces.

On the other hand, her final after EDIT learning element - in a similar manner to B1's and C1's after EDIT learning element - was not based on the schoolbook (see Appendix 22). Instead, D1 chose to design an interdisciplinary English and Religious Education learning element entitled 'Hate Speech and Interreligious Dialogue', choosing to look deeper on the other end of an up to date and hot at the time global social issue causing the large influx of refugees that C1 looked upon in her own learning element, namely Islamic extremism and hate crimes. The learning element which was actually the worksheet the teacher had designed to hand in to her students, wrote no aims, objectives, any essential question, the grade, or the language level of the students it addressed. On the other hand, it was based on material the teacher had chosen herself. The learning element involves a series of six activities starting with an activity,

1st Activity, which is underlain by Experiencing the Known knowledge processes. The students are shown some pictures of hate messages written in a cartoon form and are asked students of their personal experiences with 'hatred'. 2nd Activity, underlain by Experiencing the New and Conceptualising by Naming processes, asks from students to watch a video of a hate crime in the USA, and then discuss and define the concept of 'hate speech', say why it is dangerous and how it can spread. 3rd Activity is missing but there is an untitled extract from an unknown source about the Council of Europe's attempts to counter hate speech accompanied by its definition.

4th Activity, possibly attempting to employ Conceptualising by Theory knowledge processes and help students identify the causes of hate crimes with a religious background and lots of Conceptualising by Naming knowledge processes. It gives students some quotes by Samuel Huntignton's book 'The Clash of Civilizations and the Remaking of World Order', where a) he expresses the opinion that all present serious conflicts have religious background and students are asked whether they agree, whether they know any such conflict hitting the news nowadays, and b) Huntington predicts that Islamic extremism will become the biggest threat to world peace, and students are asked whether they know what extremism is and identify the causes of 'Islamic extremism or religious violence' filling in a graph. Then, students are shown an excerpt from Saudi school textbooks and are asked to identify the messages they carry. This task is then followed by a table with words such as anti-muslim/islam, anti-semitism, anti-christian and students are asked to give their definitions. The last task of the 4th Activity, refers to the words 'extremism' and 'radicalisation', which the teacher writes 'are two words that we hear very often nowadays' asking students to give some examples of them and then do a true/false exercise with various statements on the topic.

5th Activity, which is underlain by Analysing Functionally and Critically knowledge processes, starts with another quote by a female education activist attacked by the Taliban saying that the extremists are afraid of the books and pens and asks students why they think extremists are frightened by education, to what extent they agree, what are the consequences of using textbooks as the Saudi books excerpt read before,

how can we prevent religious violence and conflicts, and the role of religion in people's lives. Finally, 6th Activity, which is underlain by Applying Appropriately knowledge processes, again starts with two quotes from the speeches of Archibishop Anastasios of Tirana, Durres and All Albania, and Antonio Tajani, the European Parliament's First Vice-President, who talk about the need to cultivate a peaceful theology, respect religious freedom and for a dialogue between religions. The students are asked of their opinion of these two speeches and then they are asked to write a speech on the importance of interreligious dialogue or start a campaign either by writing a tweet, or creating a poster, or a video to be posted on the school website promoting interreligious dialogue.

Overall, the analysis showed that D1's lesson planning exhibited signs of growth from a mainly undifferentiated incoherent, learner irrelevant learning element building on knowledge acquisition before EDIT to a differentiated semi-coherent, learner relevant learning element building on learners' partial understanding (see Table 9.3.) after EDIT. The greatest changes were observed in D1's learning element with respect to learner relevance, differentiation and challenging higher order thinking. What follows is a more detailed presentation of the analysis results.

9.2.3.1. Before EDIT Analysis: *Pollution in urban environments*

i.   **Incoherent**

D1's learning element before EDIT, which largely follows the school textbook sequence of activities, is not a very coherent learning element. The learning element explicitly states some language learning objectives, which actually depict the particular language learning processes behind the lesson activities, even though stated in a general manner, i.e. 'to predict key points of information in a text'. The teacher begins the lesson plan by asking students to read three statements in the book about environmental problems without activating first any prior student knowledge or invite learners' subjective experiences to the lesson subtracting that way from the

lesson's overall coherence. Other than that, the learning element follows an implicit pre-reading, reading, post-reading (follow-up) structure.

However, the sequencing of short activities the teacher makes at the pre-reading stage in not very coherent. For example, the teacher first invites students to discuss about the three book statements about some environmental problems and, then, link the statements to the environmental problems, i.e. rubbish, air pollution, litter, they refer to, which does not facilitate either student understanding or having a meaningful discussion on the subject. In addition, one of the stated lesson objectives is that students will be able to write a short informal letter on an environmental problem they face. Nevertheless, this skill is not built up throughout the lesson. The final task, which was designed by the teacher as a follow-up to the reading, asks from students are solely read the three short textbook texts and use them as models to write their own letters about the most important environmental problem in their neighborhood.

ii.   Learner Irrelevant

The analysis has shown that D1's learning element before EDIT is a learner irrelevant learning element unconnected from learners' lifeworld. It starts with new learning making no attempt to connect it to any prior learner related experience. It is characteristic that the lesson begins with the teacher directing students to read three statements from the textbook, not self-reflect or share any relevant experiences from their own lifeworlds. What is more, all the tasks are closed-ended requiring one 'right' answer. For example, Task 1 asks students to match the statements with the headlines, while Task 2 is a true or false exercise. The only learner relevant point of the learning element is when the teacher asks students in a closed yes/no question 'if they have seen or experienced any of these environmental problems'. The question, though, is asked in the middle of the lesson (Step 2) failing that way to connect the lesson plan in any meaningful way to learners' prior experiences, or transfer lesson understandings to their real world context.

i.   Building on Knowledge Acquisition

With respect to D1's lesson plan focus before EDIT the analysis has shown that its focus is solely factual knowledge. In essence, it focuses only on the three specific environmental problems mentioned in the course book's reading text, i.e. rubbish, air-pollution and litter, which is not facilitative of building student holistic understanding

BEFORE EDIT	AFTER EDIT
LOW INTELLECTUAL QUALITY	**MIDDLE INTELLECTUAL QUALITY**
Incoherent • language learning objectives • no activation of prior knowledge • uneven progression of activities	**Semi-coherent** • no language learning aims or essential knowledge explicitly specified • activation of learners' prior knowledge • implicit LbD structure; not clear purpose of each activity
Learner Irrelevant • new learning unconnected with prior learner experience & lifeworld • closed-ended tasks aiming to get content 'right'; give one right *answer*	**Learner Relevant** • connects learner lifeworld (i.e. prior learner experience, interests) with new learning • open-ended tasks involving learner interests, experiences, feelings, perspectives, etc
Building on Knowledge Acquisition • work-focused; purposeless doing of exercises • lower-order thinking only, *recalling, remembering info*	**Building Partial Understanding** • concept-based • it draws interconnections across subjects (Religious Education Portfolio); draws partial interconnections between concepts • some higher-order thinking: *comparing, figuring out causes, illustration, solving, evaluating, justifying*
UDIFFERENTIATED	**DIFFERENTIATED**
	Providing a variety of Learning Styles *thinking, experiencing, and applying*
	Multimodal learner Intput: *Visual: videos and maps* **Multimodal learner Processing:** *Spatial: diagrams* **Multimodal learner Output** *Visual: tweet, a poster or a video*
	Providing Multiple Foreign Language Readiness Options: *design campaign in form of twitter, poster, video*
	Fostering Learner Autonomy:

	provision of option to choose among a number of student products
	Fostering Learning with Others work in groups in order to give definitions to concepts such a 'anti-muslim / anti-islam'

Table 9.3. D1's learning element main changes before and after EDIT

of environmental problems and their possible solutions. Instead, the students are involved in purposeless doing of exercises where they are mainly asked to do exercises while the teacher checks their answers (Task 1, Task 2, Step 2). That way, students are involved mainly in lower-order thinking processes, which have no challenge for any of them. For example, they are asked to read out statements to the class (Task 1), identify the correct answer to true or false questions (Task 2), recap previous information (Step 2), express their opinion in a yes/no question (Step 3).

ii.   Undifferentiated

Finally, D1's learning element before EDIT is a mainly undifferentiated learning element. In particular,

a) it provides learners with singular learning pathways of one learning style and one modality input and processing. Learners are solely involved in thinking processes of written-linguistic input.

b) it fosters teacher directed learning leaving no room for student autonomy. It is characteristic that the learning element focuses on teacher action instead of learner learning with phrases such as 'T directs Ss' (Task 1), 'T tells Ss' (Task 2), 'Teacher takes class feedback' (Step 2).

c) learners are involved in some social learning where they are asked to discuss in groups, but again the task lacks any meaning for the learners to engage in

d) meaningful negotiation of their different perspectives since the purpose of the task is to check the answers to the previous question (Step 2).

9.2.3.2. After EDIT Analysis: *Hate speech and interreligious dialogue*

i. Semi-coherent

D1's learning element analysis after EDIT is based on the worksheet the teacher planned and designed revealing a semi-coherent learning element. In other words, there are no language learning aims or specified, and explicitly identifies no essential knowledge to focus the learners' learning. Only implicitly it is inferred from the title and the content of the lesson that this learning element aims at sensitizing students on hate speech and the need for interreligious dialogue. The learning element also follows an implicit LbD structure being organized along six (6) different 'Activities'. The purpose of each activity, though, is not very clear since each activity contains various different tasks without explicitly connecting one with the next or explicitly stating how all these connect to a unified whole. For example, the third activity, which stands for Conceptualizing by Naming, involves students a) in the identification of current serious conflicts with a religious background, b) watching a video about Jerusalem, an example of a city divided by religious conflict, c) defining Islamic extremism and identifying its causes, d) reading some excerpts from Saudi textbooks and identifying their hidden messages, possibly as an example of ways Islamic extremism is generated, e) defining concepts such as anti-Muslim, anti-Christianism, Anti-Semitism, etc after consulting their Religious Education Portfolio or online dictionaries, f) identifying some examples of extremism/radicalisation and understand if there is a connection between the two or not, and, finally, g) reading some statements and deciding whether they are true or false.

The same implicitness characterizes the rest of the learning element where the lesson design attempts to build student understanding of the problem regarding hate crimes with a religious background, its causes, consequences and a possible solution found in interreligious dialogue, respect and tolerance of diversity. Nevertheless, the learning element succeeds in involving learners in meaningful language experiences through the connections it draws to students' current reality outside classroom, the authentic examples and language it uses, and, the essential knowledge and depth it attempts to build in their understanding.

ii.   Learner Relevant

D1's after EDIT learning element shows signs of teacher growth in the design of high-quality differentiated learning elements through the design of a more learner relevant plan, which welcomes learner lifeworld into learning. For example, the after EDIT learning element starts with asking students about their own prior experiences with hate speech. In addition, it involves students in a series of open-ended tasks, which welcome learners' own personal perspectives into learning (e.g. 4th Activity). It should be noted, though, that these tasks focus solely on student perspectives, not their feelings or interests reflecting the teacher's gradual development of her ability to design learner relevant lessons.

iii.   Building Partial Understanding

In contrast to before EDIT, D1's learning element after EDIT attempts to build on student understanding, i.e. it is concept-based focusing of student understanding of hate speech and interreligious dialogue. In essence, it is an interdisciplinary learning element attempting to draw connections with Religious Education Portfolio and help students develop deeper understandings over sensitive issues. Nevertheless, D1 does not go deep into student understanding of the problem and its interconnections with the possible causes and solutions. It provides students mainly with quotes of other people's opinions on the problem, its causes and its solution as if these opinions express the 'one and only truth' without offering them diverse opinions, factual knowledge or any other essential knowledge that will help them develop their own deep holistic understandings that will advance their learning through the medium of EFL. The end-result is a rather black or white depiction of Islam which is equated with extremism in contrast to Christianity, i.e. the final speech by the Archibishop, who condemns all forms of violence. On the other hand, the after EDIT design is a bit more challenging in comparison to before EDIT involving learners in higher-order thinking such as comparing (4th Activity), analysing the causes of Islamic extremism or religious violence (4th Activity ii), applying their understanding through the provision of examples of extremism / radicalization (4th Activity iv), finding a solution on how

religious violence and conflicts can be prevented (Activity 5th), evaluating and justifying their opinion on why extremists are frightened by education (Activity 5th).

iv.   Differentiated

Finally, D1's after EDIT learning element is a differentiated learning element along a number of variables. In particular:

a) it involves students in different learning styles such as thinking, experiencing, i.e. watching videos, and applying, i.e. starting a campaign on the importance of interreligious dialogue in our multicultural societies,

b) it provides opportunities for multimodal visual and spatial input, processing and student products such as presentation of content in the form of videos and maps, processing information through diagrams, and a student campaign in the form of a tweet, a poster or a video

a) it differentiates for students' different foreign language readiness by offering this option

b) it leaves some limited space for student autonomy by offering the option to choose among a number of student products i.e. write a speech, write a tweet, create a poster or create a video, and at the same time

c) it involves students in some limited meaningful social learning processes in Activity 4th (iii) asking them to work in groups in order to give definitions to concepts such a 'anti-muslim / anti-islam', etc.

9.2.4. The case of F2 teacher

F2 is an EFL secondary school teacher teaching at a Greek Intercultural Junior High School. Her first learning element, before EDIT, is based on the 3rd grade Think Teen Workbook, and, in particular, Unit 6 entitled 'Keeping traditions and customs alive!', Lesson 1 entitled 'Halloween and St Valentine's Day', pages 57 (see Appendix 15). The duration of the lesson was one teaching hour, while the level of the students it addressed is A2 '*(but some are in B1 and B2)*' as the teacher wrote. The learning element stated the following objectives:

- *Content: Get the students acquainted with the custom of Carnivals, talk on*

the meaning of customs and rituals in civilizations (Social studies)

- *Language skills: reading, speaking, vocabulary development and writing in follow-up*
- *Social skills: support inclusive education by working together, increasing cultural awareness, tolerance and respect among diverse backgrounds*

It was a lesson on the custom of Carnival, and it was a follow-up on the previous lesson from the course book focusing on St Valentine 's Day and Halloween. This lesson was built around the workbook's reading text about the Carnival of Rio, which had a number of gaps to be filled with the correct word. The learning element implicitly followed the traditional EFL lesson structure of warm-up (pre-reading activities), reading, vocabulary work, follow-up (writing). It started with a quick brainstorming on the meaning of customs and then the carnival while new words were explained by the teacher. Then, the students were asked to answer 'In what ways is a carnival different to Halloween' before reading the text, and a series of other questions such as 'Why do Christian follow pagan traditions?' to be answered after learners read the text. After students read the text, they were arranged in pairs and groups so that 'there is a more advanced student and a less proficient one in the same team' with the purpose of giving the best explanation to a post-it word from the text that the teacher had just given them and try to paraphrase it in English. The whole class discussed their answers and the correct interpretation was then written on the board. Then, students did the vocabulary multiple choice exercise on the workbook and the answers were again written on the board. Students were asked to answer what they knew before the reading and what they learnt after it. Again the answers were written on the board. The final task set for homework asked from learners to write a description of the carnival they attended at the weekend using at least 5 words from the text with the note that 'photos and drawing are accepted',

On the other hand, F2's final after EDIT learning element in contrast to all previous teachers' after EDIT learning elements was based on the school book (see Appendix 23). In particular, it was based on the Advanced level version of the 1st grade Think Teen course book, Unit 3 entitled 'Teen matters', Lesson 1 entitled 'Food for thought',

page 28. The teacher based her learning element on the topic of the course-book, which referred to healthy diet, but in reality she redesigned the whole lesson choosing her own material, i.e. the short YouTube video 'The 5 fabulous food groups', a reading article on 'Healthy eating for teens', a survey on healthy lifestyle, and the Home Economics book. The level of the students it addressed is A2 '(*but some are in B1)*' in F2's words aged 12 to 13. Its duration was five to seven teaching hours. The essential knowledge the learning element identified, which is called 'deep understanding focus', referred to '*comprehending the importance of good eating habits, the Mediterranean diet and the effect on the teenage body*'. Based on that, and following the LbD rationale, the learning element set a number of essential questions such as:

> *What are my daily eating habits, and should there be any changes for a better and healthier lifestyle? What truly does my daily diet include and can I improve my state of health by adopting good eating habits? What does the Mediterranean diet propose? What changes can I make?*

The learning element also set the following objectives:

Language skills: *reading, speaking, listening, vocabulary development, writing sentences and a short poem, describing a photo, debate*

Social skills: *group work, understand and analyze eating routine in pairs, giving room for changes, self-reflection.*

The structure of the learning element is the following: Experiencing the Known, Experiencing the New, Conceptualizing by Naming, Conceptualizing by Theorising, Analysing Functionally, Analysing Critically, Applying Appropriately, Applying Creatively. The learning element starts by giving students flashcards with the photo of a half food asking them to guess its name, while giving them the option to draw the rest of the food. Then, students are given bits of paper with some words on it so as to unscramble some proverbs. Then, they watch a short YouTube video about 'The 5 fabulous food groups' and asked to find what are the 5 kinds of food groups and at a second watching give two examples of each category, and write down what they

personally usually eat from the food groups presented. Then, they are asked to shuffle their Home Economics book to find more information about the categories, and bring photos of foods they like, dislike and usually eat. An optional homework is given. At the beginning of the other hour, a concept map is drawn on the blackboard with the food photos the students brought to the class, their names and characteristics. Then students just read a text entitled 'Healthy eating for teens'. There follows another optional task asking from students to make a stanza with food using a tic-tac-toe from an already filled in table.

What follows is a whole class discussion on the Mediterranean pyramid picture in the course book and the reasons why it is important to pay attention to what they eat. There follows another optional survey on healthy lifestyle, after which students talk on their food preferences with 5 to 7 volunteers coming in front of the class moving to the sign 'I do', or 'I don't' depending on what their peers say. Then, students are asked to draw flashcards with their emotional response to various dishes. A short dramatization takes place with the class taking on the roles of dad, mum, self, brother at a Sunday lunch table time and audience with the parents giving advice referring to the Mediterranean pyramid, one kid agreeing, the other objecting to the advice, and the audience observing the actors behavior and taking notes. Then, students are asked to keep a weekend diary of their diet following the pyramid and marking the quantities consumed, and present their eating habits profile in a written form including their weekend eating practices, an analysis of how close or far they are form the Mediterranean pyramid. Finally, students exchange their papers and a third paragraph is added on their journals by a peer making suggestions on how and what to do to get closer to good Mediterranean eating habits'.

Overall, the analysis showed that F2's learning element before EDIT was a partially differentiated, semi-coherent, learner irrelevant learning element building on knowledge acquisition (see Table 9.4.). In contrast, after EDIT F2's learning element design showed signs of growth and development into a differentiated, coherent, semi-learner relevant learning element building on understanding. What follows is a more detailed presentation of the analysis results.

9.2.4.1. Before EDIT Analysis: *Keeping traditions and customs alive!*

i. Semi-coherent

F2's learning element before EDIT, which is mainly planned by the teacher using the reading text of the workbook as a starting point, is a semi-coherent learning element. Adding to its coherence, the learning element explicitly states that it is a continuation of the previous lesson on St Valentine's and the Halloween. It is the only learning element specifying a combination of a) understanding objectives such as talk on the meaning of customs and rituals in civilizations, b) general language skill development aims such as reading, speaking, vocabulary development, and c) social skills aims such as support inclusive education by working together, increasing cultural awareness. The learning element starts by activating learners' prior vocabulary knowledge on the topic by a brainstorming on carnival. Only at its final stage, it welcomes students' prior experiences and knowledge on the carnival – a process that would add greater meaning to learners' learning.

The progression of the activities is logical following the conventional EFL tradition of pre-reading, while-reading, follow-up. The reading of the text is followed by some vocabulary work and reading comprehension exercises together with a short discussion on what students already knew and two new ideas they learnt about the carnival, while the follow-up involves writing a description of a carnival they attended. In terms of its coherence, the learning element does not achieve its understanding objective, i.e. talking on the meaning of customs and rituals in civilizations or increasing learners' cultural awareness as it was stated in the lesson's objectives. In reality, the understanding and cultural awareness raising objectives it sets would require linking the information about the Rio carnival presented in the text with the concept of customs and rituals and comparing it with carnivals in other civilizations.

i. Learner Irrelevant

The analysis has also shown that F2's learning element before EDIT could be characterized as a mainly learner irrelevant learning element. The very first activity, which involves learners in a quick brainstorming on the meaning of customs, is a weak

BEFORE EDIT	AFTER EDIT
LOW INTELLECTUAL QUALITY	MEDIUM INTELLECTUAL QUALITY
Semi-coherent • continuation of previous lesson • clear & concrete language learning & understanding objectives • activation of prior vocabulary knowledge • logical progression of activities: pre-reading, reading, follow-up • not achieve understanding objectives	**Coherent** • a number of essential questions • concrete understanding objectives • activation of prior vocabulary knowledge • logical LbD progression of activities creating a unified whole • achieves understanding objectives
Learner Irrelevant ✓ it starts with prior learner knowledge with respect to new learning (not learner lifeworld such as prior experiences, interests, etc) ✓ closed-ended tasks aiming to get content 'right'; give one right answer	**Semi Learner Relevant** • it starts with prior learner knowledge with respect to new learning (not learner lifeworld such as prior experiences, interests, etc) • open-ended tasks involving learner interests, experiences, feelings, perspectives, etc
Building on Knowledge Acquisition • focus on factual knowledge • lower-order thinking only *recalling, remembering, identifying answer*	**Building Understanding** • concept-based, but not thorough exploration of concepts • it draws interconnections across subjects (Home Economics) but not between concepts as part of a coherent whole • higher-order thinking: *classifying, using, examining, applying*
PARTIALLY DIFFERENTIATED	**DIFFERENTIATED**
Providing Multiple Foreign Language Readiness Options *differentiated pairs and groups of mixed language proficiency, i.e. more advanced and less proficient.*	**Providing of a variety of Learning Styles** *thinking, experiencing and applying*
Multimodal learner Output: *visual: photos & drawings attached*	**Multimodal learner Intput:** *visual: flashcards, videos* **Multimodal learner Processing** ✓ *spatial processing of information, i.e. a concept map* ✓ *gestural: short dramatization;*

	students moving to the sign 'I do' or 'I don't' **Multimodal learner Output** ✓ *tactile: having the option to draw*
	Fostering Learner Autonomy: *provision of options*
Fostering Learning with Others *Pairs & groups*	**Fostering Learning with Others** *pair and group work throughout the learning element*

Table 9.4. F2's learning element main changes before and after EDIT

attempt to connect learners' prior knowledge on the topic with new learning. In essence, it does not welcome learners' real life experiences or interests with respect to carnivals and customs. In fact, F2 asks learners to write about their real life experiences with carnivals (Follow up 2 Homework) at the end of the lesson and, thus, fails to give meaning to their previous learning experience. What is more, the rest of the learning element consists of mainly closed-ended tasks with one 'right' answer such as trying to find the best explanation of some words the teacher hands out to students in post-it (4), or doing a multiple choice exercise from the book (5). Such tasks focus solely on student factual knowledge not leaving space for their lifeworld to come into the class and make learning more relevant to them. This lack of learner relevancy and their pressing need to find some meaning to the lesson and feel connected to it is succinctly expressed in the final teacher note at the end of her learning element narrating a crucial turning point during her teaching of this learning element, which was in reality irrelevant to the lesson:

One interesting point was that they asked me whether I have been to other countries and which ones. When I answered that I have been to some of their homelands (these are kids from all over the world), they were impressed and satisfied to hear something about their country. This turned the hour to a more personal and intimate talk.

ii.   Building on Knowledge Acquisition

With respect to F2's before EDIT learning element focus the analysis has shown that in a similar manner to D1's before EDIT learning element its focus is factual knowledge only. The focus of the learning element refers to the specific information and facts mentioned in the reading text of the Think Teen book. As a result, the learners are involved mainly in lower-order thinking such as recalling vocabulary (Activity 1 & 4) and identifying the correct answer to questions (Activity 2 & 5). Interestingly even questions such as 'Why do Christian follow pagan traditions?', which could involve learners in higher order thinking is transformed into a lower-order thinking question by setting it to be answered after the reading and involving learners in a mere process of identifying the correct answer. There is only one question set at the beginning of the lesson, i.e. 'In what ways is a carnival different to Halloween?', which invites students to think at a higher order and compare Halloween, the focus of the previous lesson, with the Carnival.

iii.   Partially Differentiated

The analysis has shown that F2's learning element before EDIT is a differentiated learning element in terms of multimodality, learning with others and foreign

language readiness. In particular,

a) it provides learners with the option to produce written descriptions of the carnivals they attended complemented with photos and drawings if they wish

b) it offers students the opportunity to learn with others in differentiated pairs and groups of mixed language proficiency, i.e. more advanced and less proficient. It is important to note, though, that group work is set in the context of a rather meaningless task not leaving much space for dialogue and negotiation such as finding the best explanation for a post-it word.

9.2.4.2. After EDIT Analysis: *Give some though on food*

i.   Coherent

The analysis has shown that F2's after EDIT learning element, which is wholly planned and resourced by the teacher, is a coherent learning element. It clearly identifies the lesson's essential questions and it sets some very concrete understanding objectives such as learners 'comprehending the importance of good eating habits, the Mediterranean diet and the effects on the teenage body'. At the same time, F2 writes a) some general language learning development aims such as reading, speaking, describing a photo, and b) some social skills aims such as group work and reflection. The learning element starts by activating learners' prior vocabulary knowledge on the subject, but learner subjectivity of learners' own experiences and interests on the topic is introduced later in the LbD-structured lesson, at the Experiencing the New stage.

The progression of the rest of the lesson activities is logical building on each other and creating a quite holistic whole building learners understanding on diverse food categories, the Mediterranean diet and its effect on the teenage bodies. It is indicative that the final tasks at the Applying stage transfer student understanding in their own lifeworld asking them to keep a diary of their eating habits, analyze it how close or far it is to the Mediterranean diet, helping them self-reflect and possibly change food habits. It is interesting to note that while F2's after EDIT learning element is designed for a lower-level students, i.e A2 level (some B1), than before EDIT, i.e. B1 level, the language experiences learners have are more varied with a richer and more meaningful language input.

ii.   Semi- Learner Relevant

After EDIT, F2's design is more learner relevant but still semi-relevant. Like before EDIT, F2 chooses to start by activating learners' previous knowledge on vocabulary about food, which does not facilitate learners to see the connection with their lifeworld. Prior vocabulary knowledge activation may facilitate learning of new vocabulary but it does not make learning meaningful for learners to see a connection and relevant to their lives and interests. On the other hand, it includes lots of open-ended tasks welcoming learner lifeworld into learning. For example, the students are

asked to write down what they personally usually eat from the food groups presented (Experiencing the New), their food preferences (Analyzing Functionally) or asked to keep a weekend diary on their diet (Applying Appropriately). In essence, F2's learning element offers a number of different entry points to connect learner experience with new learning except from the beginning of the lesson, which is a crucial starting point for any lesson. Finally, the learning element attempts to effectively transfer learner understandings to their real life by keeping a weekend diary on their eating habits and reflecting on it with the help of their peers (Applying Appropriately & Creatively).

iii.   Building on Understanding

The analysis has shown that F2's learning element after EDIT attempts to build student understanding and conceptual knowledge of 'good eating habits' necessitating higher-order thinking. It is an interdisciplinary learning element interacting with Home Economics (see Experiencing the New) and revealing the teacher's attempt to draw connections to other school subjects creating a meaningful lesson. Indeed, after EDIT F2's learning element reveals signs of teacher growing development. Her after EDIT learning element is a more challenging learning element involving learners in some conceptualization of a healthy eating diet by differentiating among the different food characteristics, explaining its importance in connection to the Mediterranean pyramid (Conceptualizing by Naming & by Theorizing). This learning element's weaknesses refer, firstly, to its not challenging enough introduction, where learners are involved in lower-order thinking of guessing the name of half-drawn pictures of food and unscrambling of some proverbs, where they employ mere recalling and memorizing thinking processes. Secondly, they pertain to its almost surface and partial building of an interconnected intellectual whole facilitating learners' thorough understanding of the lesson concepts. For example, it does not draw connections of the effect of a healthy and an unhealthy diet to the teenage body, or explore in depth the concept of change and how easy or difficult it is to change eating habits, a concept mentioned in the lesson objectives.

iv.   Differentiated

Finally, F2's after EDIT learning element is differentiated to a greater extent than before EDIT. In particular, she provides learners with

a) a variety of learning pathways such as three different learning styles, i.e. thinking, experiencing and applying, and multimodal visual input such as flashcards (Experiencing the Known) and videos (Experiencing the New), spatial processing of information, i.e. a concept map on the blackboard with food photos and their characteristics (Conceptualising by naming), tactile student output, i.e. having the option to draw (Experiencing the Known), and, finally, gestural processing of information such as the short dramatization in class (Analysing Critically) and students coming in front of the class and move to the sign 'I do' or 'I don't',

b) opportunities for learner autonomy through options offered at four different points throughout the learning element (Experiencing the Known & the New, Conceptualising by naming & theorizing) and self-reflection by keeping a weekend diary on their diet habits, and

c) opportunities to learn with others through pair and group work throughout the learning element (Experiencing the Known, Analysing Critically, Applying Creatively).

9.2.5. The case of G2 teacher

G2 is an EFL secondary school teacher teaching at a Greek Vocational Senior High School. Her first learning element, before EDIT, is designed for the specialty of Computer Technicians of the 2nd grade of senior high school and it is based on the book 'Information Technology' by Express Publishing, Book 2, Unit 2, page 6 (see Appendix 16). The aim of the learning element is stated as follows:

- *Teach vocabulary related to programming languages and software / hardware upgrading*
- *Writing a formal email*

The learning element is built around the reading text of the book's unit, an email the Head of the Computer Programming Department of a company has written to the manager explaining to him what the needs of the Department are and asking him for an upgrade of the resources. The structure that the learning element followed was the following: Warm-up, Reading, Vocabulary focus, Speaking and Writing. The learning element, started with some warm-up questions such as 'Who wants to become a computer programmer' or 'How does computer programming affect businesses?'. Then, students were asked to read the text in their course books while listening to it on the CD player. The teacher asked them questions such as 'what kind of a text it is', 'who wrote it', 'to whom', and 'why', and then students read it once more so as to answer the multiple choice questions in the book. The teacher wrote the new vocabulary on the blackboard asking students about the meaning of the words, whose definitions were given by 'some students who are very good at computers' and the glossary at the back of the book. Then students are asked to do in pairs the vocabulary exercises in the book. Then two pairs of students are asked to act out a dialogue between the Head of the Programming Department and the manager of the company. The final task asks from students to write an email responding to the Head as if they were the managers of the company.

On the other hand, her final after EDIT learning element is designed for the specialty of Health Care / Wellbeing / Social Welfare of the 2nd grade of senior high school (see Appendix 24). The level of the students it addresses is quite varied, A1 to C1, and ages 16 to 23, while its duration is five teaching hours. It follows an LbD rationale and the core essential question the learning element sets out to answer is 'what the most effective behavior of human nurses is,' while other secondary questions it sets are:

> *Will nurses be replaced by robots in the future? What can robot nurses*
> *do better? Which behaviours of humans cannot be performed by robots?*
> *Are human nurses irreplaceable or is your job threatened by robots?*

This is a learning element which is not based on the course book. Instead, the teacher has chosen her own material, i.e. three short YouTube videos of robot nurses used in

hospitals, four YouTube videos of poor and effective interaction between nurses and patients, four reading texts from various sources about robots performing the tasks of the nurses and a text about the problems that might occur when using robot nurses. The learning element follows the following structure: Experiencing the Known, Experiencing the New, Conceptualising by Naming, Conceptualising by Theorizing, Analysing Functionally, Analyzing Critically, Applying Appropriately and Applying Creatively. The lesson begins with Experiencing the Known, where learners are welcomed to share their own personal experiences from hospitals with the whole class asking a series of questions such as '(h)ow did they feel while waiting to be seen by a doctor?' evoking details of the learners whole experience. Then are left to Experience the New by watching three videos of robot nurses used in hospitals and asked to express their first impressions. The teacher effectively lets students experience the new information affectively first without involving them in any thinking processes. Then students Conceptualizes by Naming and by Theorising with more input on robot nurses. Four student groups are given four different articles about different robots, asked to make a list of the services each robot can provide, then explain to the rest of the class as if they worked at the hospital with the robots and answer questions such as '(w)hat do you think of the idea of using robots instead of nurses in hospitals?'.

Then with Analysing Functionally and Critically learners go deeper into their exploration and understanding of the two concepts, robot nurses and human nurses. Students get more input in the form of a text and two sets of short videos being facilitated to think about the downside of using robot nurses, the importance of humans, conceptualize and analyze what the characteristics are of a good nurse, what human behavior should be avoided, what makes poor and effective interaction with patients, and finally think about the pros and cons of both robot and human nurses. Finally, the last stages of the learning element, Applying Appropriately and Creatively, close-up this unit by giving students the choice to either write a letter from a patient's perspective and thank the manager of the hospital for the care they received from the nurses, or act out a scene from a hospital room with a patient and a robot with the majority of the students playing out the role of the nursing staff. Both of these tasks

provide students with the opportunity to either act out or describe effective behavior of human nurses. The end product, though, of the learning element are posters that students in groups are asked to create so as to inform their community why their hospital values human nurses more than robots.

Overall, the analysis has shown that G2's lesson planning ability exhibits signs of growth from the design of an undifferentiated coherent, learner irrelevant learning element building on knowledge acquisition before EDIT to a differentiated, coherent, learner relevant learning element building on learner understanding (see Table 9.5.) after EDIT. The greatest changes were observed in G2's lesson planning with respect to learner relevance, building learner understanding with challenging higher order thinking and differentiation. What follows is a more detailed presentation of the analysis results.

9.2.5.1. Before EDIT Analysis: *Programming Languages*

i.   Coherent

G2's learning element before EDIT is a quite coherent learning element based on the school textbook. It sets a quite concrete and a rather vague objective. The first refers to what the teacher is expected to do, i.e. '(t)each vocabulary related to programming languages and software/hardware upgrading'. The second objective refers to what learners are expected to do by the end of the lesson, and that is, write a formal email with no other specifications included. The learning element starts by activating learners' prior knowledge and interest on the topic. The logical progression of the learning element's activities follow a clear structure of Warm-up, Reading, Vocabulary focus, Speaking and Writing in the standard TEFL skill-development tradition. What connects the lesson activities is the content of the reading text, i.e. an email of the Head of the Computer Programming Department, since all of the lesson activities center around it. This learning element is successful in achieving both its objectives, the teacher does teach vocabulary related to programming languages and the learners

do write a formal email at the end. Finally, even though there is no understanding aim, the fact that that it is an English for Specific Purposes learning element, addressing students who specialize as computer technicians, i.e. it addresses their interests, add greatly to its meaningfulness for students.

ii.   Learner Irrelevant

The analysis has also shown that G2's learning element before EDIT is a learner irrelevant learning element. The learning element starts with a question which attempts to connect the learners' lifeworld with the lesson's new learning asking '(w)ho wants to become a computer programmer?'. However, this is a question which is set to address only students, who want to become computer programmers. The learners who are not interested in computer programming are left out finding no meaning in new learning. In addition, all the rest of the learning element's tasks are closed-ended tasks aiming students to give the 'right' answer leaving no room for their lifeworld to come into their learning.

iii.   Building on Knowledge Acquisition

With respect to G2's learning element focus before EDIT the analysis shows that like the previous teachers' before EDIT learning element its focus is factual knowledge only and in

BEFORE EDIT	AFTER EDIT
SEMI INTELLECTUAL QUALITY	**HIGH INTELLECTUAL QUALITY**
Coherent • a concrete & a general language learning objective • activation of prior vocabulary knowledge • logical progression of activities: warm-up, reading, vocabulary, speaking, writing • objectives achieved	**Coherent** • concrete understanding objectives • essential questions focusing the lesson tasks • activation of prior experiences • logical LbD progression of activities creating a unified whole • objectives achieved
Learner Irrelevant ✓ new learning unconnected with prior learner experience & lifeworld	**Learner Relevant** • it starts by connecting learner lifeworld (i.e. prior learner experience, interests) with new learning

✓ *closed-ended tasks aiming to get content 'right'; give one right answer*	• open-ended tasks involvinsg learner interests, experiences, feelings, perspectives, etc
Building on Knowledge Acquisition • factual knowledge only, i.e. terminology • lower-order thinking only *identifying the correct answer, checking the definitions of the words at the glossary , recalling synonyms*	**Building on Understanding** • concept-based • it draws interconnections between concepts and/or across subjects, i.e. interdisciplinary, as part of a coherent whole • higher-order thinking *comparing, contrasting, analyisng critically, arguing*
UNDIFFERENTIATED	**DIFFERENTIATED**
	Providing of a variety of Learning Styles *Experiencing, Reflecting, Thinking, Acting*
	Multimodal learner Input Visual, videos **Multimodal learner Processing** • tactile / visual: produce poster • tactile: acting out
	Fostering Learner Autonomy *provision of an option at the end*
	Fostering Learning with Others *pair, group work, the whole class together*

Table 9.**5.** G2's learning element main changes before and after EDIT

particular vocabulary related to programming languages and software/hardware upgrading. As a result, the learners are asked to learn isolated bits of information like vocabulary written on the blackboard (Activity 4) and do exercises like acting out a dialogue pretending to be the Head of the Programming Department and the manager of the company (Activity 6). In parallel, they are involved in lower-order thinking processes, which are not challenging enough, such as identifying the correct answer in the reading text (Activity 2 & 3), checking the definitions of the words at the glossary (Activity 4), recalling synonyms (Activity 5). On the other hand, a number of tasks focus on learner doing with the purpose of foreign language usage and practice. Such practice-focused activities involve learners in higher-order thinking processes, lacking, though, the foundation of meaningful prior understanding. For example, learners were asked 'to use the new vocabulary in sentences' (Activity 5), act out a dialogue (Speaking) and produce written speech in the form of an e-mail (Follow-up).

iv.   Mainly Undifferentiated

Finally, G2's learning element before EDIT is a mainly undifferentiated learning element. In particular,

a) it provides learners with singular learning pathways of one learning style and one modality input and processing. Learners are solely involved in thinking processes of written-linguistic input.

b) it fosters teacher directed learning leaving no room for student autonomy. It is characteristic that the teacher systematically uses the verb 'ask' either in the active or the passive voice as an introduction to the activities. For example, 'I ask students to read' (Activity 3), or 'they are asked to go on with the vocabulary exercises' (Activity 5).

c) learners are involved in some social learning where they are asked to act out a dialogue in pairs (Speaking).

9.2.5.2. After EDIT Analysis: *Human nurses versus robot nurses*

i.   Coherent

G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element in the form of questions such as '(w)ill nurses be replaced by robots in the future?' to be answered throughout a series of five lessons. The binding force behind this unit of five lessons is one essential question asking and trying to explore throughout the unit '*what the most effective behavior of human nurses is'*. The learning element also sets some communication aims such as 'showing empathy' or 'dealing with patients'. It follows an explicit LbD structure while the progression of the activities is aligned to the lesson objectives gradually building on student understanding and creating a unified whole, which helps learners answer in depth the unit's essential question. For example, the whole analyzing section builds on student understanding of what constitutes poor and effective interaction of a human nurse with a patient. Characteristically, the lesson design goes a step further to help

students look at the issue from the perspective of the receiving end as well, i.e. being a patient, asking them 'what the specific characteristics of human behavior are that make patients feel better when they are hospitalized'.

ii. Learner Relevant

G2's G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element.after EDIT reveals signs of growth and development with respect to its learner relevancy. The lesson begins with Experiencing the Known, where learners are welcomed to share their own personal experiences from hospitals with the whole class. At this stage, the teacher manages effectively to bring out learners' prior experiences on the topic with a series of questions such as '(h)ow did they feel while waiting to be seen by a doctor?' evoking details of the learners' whole experience. In addition, the great majority of the tasks are open-ended tasks welcoming learners' impressions, feelings and perspectives into the learning. For example, the four questions at the end of the Conceptualising by Theorising stage are questions that follow a reading activity. Nevertheless, they do not follow the EFL tradition of reading comprehension questions, but are open-ended asking from learners to think for themselves and express their own perspective. It is important to note, though, that at the end students are asked to create some posters in order to inform their community why their hospital values human nurses more than robots, which is a bit teacher directed leaving no room for learners to choose whether they would like to support robot or human nurses.

iii. Building on Understanding

As the previous section on the learning element's coherence has shown, G2's after EDIT learning element builds effectively on student understanding. It is a concept-based G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element.asking from students to compare and contrast robot nurses with

human nurses, and concludes on the most effective behavior of human nurses that actually makes them irreplaceable by technology. These are broad, cross-curricular and transferrable 'big ideas', which help students think in greater depth about technology advances and the role of humans in a modern technologically advanced society. Learners go deep into their exploration and understanding of the two concepts, robot nurses and human nurses. For example, in Conceptulise by Theory they are given a rich source of input, i.e. four different articles, to compare and contrast robot with human nurses, and analyse critically by answering whether the two could co-exist. In addition, the lesson design succeeds in five time periods to draw interconnections between different concepts facilitating students develop holistic understandings of the use of technology in hospitals, i.e. the services it offers and the problems it creates, and the qualities of human interaction, i.e. poor and effective communication, that make humans irreplaceable by taking into consideration its effect on patients. The end result is learners' development of language skills through a wide and rich variety of meaningful and challenging language experiences such as reading various texts, watching videos, debating in English, etc.

iv.   Differentiated

Finally, G2's after EDIT learning element is differentiated, in contrast to the before EDIT G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element.. In particular, she provides learners with

a) a variety of learning pathways such as three different learning styles, i.e. thinking, experiencing, reflecting and applying, and multimodal visual input such as a series of videos while offering them the choice to process information by acting out, or producing a poster.

b) limited opportunities for learner autonomy through an option offered at the end of the learning element (Applying Appropriately).

c) opportunities to learn with others through pair, group work and the whole class together throughout the learning element (Experiencing the Known, Conceptualising by Naming, Conceptualising by Theorising,

Analysing Functionally, Analysing Critically, Applying Appropriatley, Applying Creatively)

9.2.6. The case of H2 teacher

H2 is an EFL secondary school teacher teaching at a Greek General Senior High School. Her first learning element, before EDIT, refers to the 1st grade of Senior High School and it addresses level B1 and above of English language proficiency (see Appendix 17). The duration of the learning element is 45 minutes, while the aims / objectives it writes are:

- *To learn to use Past Simple / Continuous*
- *To develop and practice speaking skills*

The G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element.was based on a 6 minute video extract from the movie 'The Pursuit of Happyness', a worksheet with a Past Simple, Past Continuous exercise and their Workbook, whose bibliographic information was not mentioned, with some more exercises on the two past tenses. The focus of the learning element was grammar practice of Past simple and Past continuous in the context of a film story. It started with an activity which referred to students filling in a worksheet on the two tenses. Then, they watched a 6 minute video of a movie, 'The Pursuit of Happyness' with which the teacher mentioned students were already familiar with. The purpose of this video watching seemed to be to add meaning to the following form-focused exercises since the next activity referred to students filling in the gaps with the two tenses in sentences telling the story of the video. In the following activity, students were asked to tell the story of the video in a quite incoherent manner since each student had to say one sentence with the help of the previous gap-filling activity. The learning element ended with the students doing one more exercise on tenses in their workbook. The homework assigned asked from advanced students to write a paragraph and struggling students to write sentences about things they did / were doing yesterday.

On the other hand, H2's final after EDIT G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element.referred to the 2nd grade of Senior High School addressing level B2 of English language proficiency (see Appendix 25). The learning element was designed from the teacher from scratch, i.e. it was not based on the course book and its duration was 8 teaching hours. The learning element followed the LbD rationale and it set the following essential questions:

- *Is music just for fun?*
- *How can we benefit from music?*
- *Do we "listen" to music or just "hear" it?*

The rationale of teachers' learning element on music as stated by H2 was that '*the idea behind it is to make students think seriously about music because it's worth pondering over it'.* Elsewhere, she wrote music *'can set a promising stage for lessons in foreign languages so as to get students into an effective learning state. Through the learning element music is used as a powerful anchor that moors learning in memory'.* However, despite the use of music as a tool to get students into an effective learning state, H2 sees value in a learning element about music, because a) *students get acquainted with certain benefits of listening to / playing music, i.e. music can have healing powers, music feeds the soul*, and b) *students' attention is drawn to lyrics because they matter. They should embrace it fully since lyrics tell a story or describe a situation.*

The G2's learning element after EDIT is a coherent learning element wholly designed by the teacher. It specifies some concrete understanding aims set at the beginning of the learning element.had the following structure: Experiencing the Known, Experiencing the New, Conceptualizing by Naming, Conceptualizing by Theorizing, Analysing Functionally, Analysing Critically, Applying Appropriately, Applying Creatively. At the beginning of the learning element, students were introduced to new

learning with simple personal questions, such as whether they like listening to music, how often and why. Then a number of quotes about music followed requiring from students to pick the one that expressed them explaining the reason why, and a number of pictures from singers and groups of past decades such as Michael Jackson or the Rolling Stones asking from students to choose their favorite one explaining why. Then students watched a nine minute video answering the question 'How music changed Derek's life?'. Then, there followed an article reading and students were asked to explain how music can affect a child's / adult's life. Then, students were given a concept map to fill in with various kinds of music before listening to various songs so as to categorise them. Students were, then, asked to list the reasons why people listened to music, and when they listen to it whether they pay attention to the rhythm, the lyrics or both. Then, they listened to some more songs and asked to find the 'conveyed messages'.

The rest of the tasks switched the students' focus from the music rhythm, i.e. kinds of music, to the lyrics of two particular songs, Iron Maiden's 'Alexander the Great' and 'Empire of the clouds', followed by a number of listening comprehension questions. In the following task, the teacher started by writing 'Students acknowledge the positive effect music has on people's lives, especially teenagers and discuss about the way they can benefit from it'. Then students in two groups were asked to make a debate about 'good' and 'bad' music and its effects on young people each group representing parents and teenagers. Next, students were asked to write about the impact of music/songs on their personal life and share their ideas by acting a dialogue. The final task asked students to play their favorite song or present it their favorite song explaining why it is their favorite or create a video clip for their favorite song.

Overall, the analysis has shown that H2's lesson planning exhibits signs of growth from a semi-differentiated incoherent, learner irrelevant learning element building on knowledge acquisition before EDIT to a differentiated semi-coherent, semi learner relevant learning element building partially on understanding after EDIT (see Table 9.6.). Changes were observed in all of differentiated high-quality lesson planning

indicators in H2's lesson planning ability in a process of gradual development. What follows is a more detailed presentation of the analysis results.

9.2.6.1. Before EDIT Analysis: *Past Simple vs Past Continuous*

i.   Incoherent

The analysis has shown that H2's learning element before EDIT, which is wholly planned and resourced by the teacher in an attempt to complement the school workbook, is not a very coherent or well-thought out learning element. In particular, the learning element sets a specific language learning objective, that is, learn to use Past Simple and Past Continuous, and a general language skill development aim, i.e. the development and practice of speaking skills. The activities of the learning element actually involve learners in drilling exercises, where they practice the use of Past Simple and Past Continuous. As a result, there is no logical progression but simply exercises one after another including exercises in a worksheet and in the workbook. It is characteristic that there is no activation of learners' prior knowledge on the lesson's knowledge focus. The learners are simply asked to read the activity that they are about to do after watching a short video. The fact that the exercises are done in the context of a movie watching adds some meaning and interest to the learning element and the drilling exercise referring to the plot of the movie. Nevertheless, even the speaking task, which asks from learners to tell the plot of the movie video they watched, resembles the drilling exercises since each student is asked to say only one sentence.

ii.   Learner Irrelevance

H2's before EDIT learning element could be characterized as a learner irrelevant learning element. New learning is unconnected from any previous learner experiences. The learning element starts with an exercise on Past Simple and Past Continuous, a grammar practice activity, which creates no meaning for the learners since it does not draw on any meaningful previous experience. In addition, all the activities are closed-ended requiring one right answer. Even the story telling activity

of the video they watch is actually a closed-ended task since it is structured in such a way so that each student tells one sentence with the help of the previous gap-filling activity – leaving no room for learner creativity or their own voice to be heard in a meaningful and coherent stream of speech. It is also important to note with respect to learner relevancy that the level of the students is stated to be B1 and above, and at that level learners are expected to be quite familiar with the use of those two past tenses making the lesson not relevant and not challenging at all for them.

iii.   Building on Knowledge Acquisition

The rationale underlying H2's learning element before EDIT is that of factual knowledge acquisition, which in the particular learning element puts emphasis on form acquisition, i.e. grammar, and mere doing of workbook and worksheet exercises which ask from students to use the correct form in the context of a video watching, which adds some meaning to the exercise-doing. As a result, learners are involved in lower-order and not challenging at all thinking processes of recalling the movie plot and identifying the correct answer to the gap filling exercises.

iv.   Partially Differentiated

Finally, H2's learning element before EDIT is a mainly undifferentiated learning element with a slight not very effective attempt to differentiate according to student language readiness. In particular,
   a) it provides learners with singular learning pathways of one learning style and one modality input and processing. Learners are solely involved in thinking processes of written-linguistic input.
   b) it leaves no room for student autonomy. Learners are given no options, no chance to self-reflect or express themselves
   c) it offers no opportunities for learning with others. The focus is only on individual learning.

it attempts to foster foreign language readiness by giving learners the option to produce a full paragraph or disparate sentences depending on their language level, i.e. advanced or struggling learners. It is important to note though that the option for struggling learners to just write unconnected sentences just subtracts any meaning for such a form-focused exercise.

BEFORE EDIT	AFTER EDIT
LOW INTELLECTUAL QUALITY	**SEMI INTELLECTUAL QUALITY**
Incoherent • a concrete & a general language learning objective • no activation of prior knowledge • no logical progression • objective not achieved	**Semi-coherent** • essential questions • activation of prior experiences • uneven progression of activities (i.e. two meaningful units) aligned with the lesson objectives • essential questions partially answered
Learner Irrelevant ✓ new learning unconnected with prior learner experience & lifeworld ✓ closed-ended tasks aiming to get content 'right'; give one right answer	**Semi- Learner Relevant** • Open-ended tasks • it starts by connecting learner lifeworld (i.e. prior learner experience, interests) with new learning • closed-ended tasks aiming to ▪ get content 'right'; give one right answer • no transfer to real life
Building on Knowledge Acquisition • Work-focused; purposeless doing of exercises • lower-order thinking only: *recalling, Identifying, describing, applying appropriately*	**Building Partial Understanding** • concept-based • some interconnections drawn at a superficial level • some higher-order thinking: *explaining, classifying, figuring out cause & effect, arguing*
PARTIALLY DIFFERENTIATED	**DIFFERENTIATED**
Providing Multiple Foreign Language Readiness Options *Provision of an option for advanced and struggling learners.*	**Providing a variety of Learning Styles**. *thinking, experiencing and applying*

	Multimodal learner Input
	  ✓ *Visual, videos,*
	  ✓ *Audio: songs*
	Multimodal learner Processing
	  ✓ *Tactile-spatial: concept map*
	Multimodal learner Output
	  ✓ *Tactile / Audio: playing their favorite song or creating a video clip.*

	Fostering Learner Autonomy: *provision of options and self-reflection* &

	Teacher Directed Learning: *teacher control; transmissiveness*
	Fostering Learning with others: *a two-group debate; acting a dialogue*

Table 9.6. H2's learning element main changes before and after EDIT

9.2.6.2. After EDIT Analysis: *Songs for…thought!!!*

i. Semi-coherent

H2's after EDIT learning element wholly planned and resourced by the teacher is a semi-coherent learning element. The learning element sets three essential questions. Out of the learning element's three essential questions only one is an open-ended question leaving the space for learners to explore the answer throughout the lesson, i.e. '(h)ow can we benefit from music?'. The other two are yes/no questions indicating no essential knowledge since they can be answered with a yes or no. At the same time, the learning element activities follow a quite uneven progression. The learning element seems to have two different foci intermingling with each other and creating two distinct meaningful units. The first unit, which constitutes the main body of the learning element, seems to be aligned with the vague aim the teacher sets at the beginning of the rationale, that is, to be an incentive for learners to talk about music and listen to it, while the second meaningful unit seems to be aligned with the open-ended essential question attempting to facilitate students think how music can benefit people. A characteristic examples pertains to the first two stages of the learning element, Experiencing the Known and the New. Experiencing the Known using quotes about music and pictures of music bands and singers begins the first meaningful unit of the learning element, i.e. an incentive to talk about music and listen to it. On the other hand, Experiencing the New using a video about Derek, whose life changed by music, and the article explaining how music can affect a child's / adult's life begins the second meaningful unit of the lesson, i.e. facilitating students see how music can benefit people.

ii. Semi Learner Relevance

H2's after EDIT learning element is a semi learner relevant learning element. In particular, it starts by asking students whether they like listening to music, how often and justify their answer. That way it attempts to welcome students' own lifeworld experiences by answering a general yes/no question, giving general information on the frequency and then intellectually justify their answer. In other words, it does not welcome any particular learner experiences which can evoke memories, feelings and sharing of student music stories making their learning more relevant to them. But more importantly, this initial question does not connect to any prior student experiences about music beneficial effects, which is the focus of the lesson unit. Instead, a relevant question asking students about the impact of music / songs on their personal life is made towards the end (Applying Appropriately), at which point it does not very effectively show learners how new learning connects to their own lifeworld.

On the other hand, the learning element also balances between open-ended and closed ended tasks. In particular, it includes a number of open-ended tasks and questions welcoming student experiences and thoughts into learning making it more relevant to them. For example, students are welcomed to take on the roles of parents and teenagers and express their opinion/thoughts about 'good' and 'bad' music and its effect on young people (Analysing Critically), or choose the favorite singer or band from the pictures shown and explain their choice (Experiencing the Known). It is important to note, though, that the great majority of the singers and groups such as Michael Jackson or the Rolling Stones shown to them are from past decades, and probably make no sense to them. It also includes a number of closed-ended tasks which aims for students to give the right answer. For example, at the Analysing Functionally part students are asked to find out the conveyed message of the songs they listen to, or answer a number of comprehension questions.

iii.   Partially Building on Understanding

H2 in her after EDIT learning element attempts to focus her lesson on concepts rather than specific facts such as the concept of 'music benefits', or 'kinds of music'.

Nevertheless, the learning element does not go at any greater depth to thoroughly explore each learning element concept e.g. the different kinds of music and how they connect to different effects (positive and/or negative) or how they connect to different forms of art in general. In effect, it draws slightly any interconnections between its different concepts, or transfer to students' lives. What is more, the learning element has characteristics of knowledge acquisition rationale emphasizing isolated bits of information at the Analysing Functionally part where students are asked to understand and answer questions referring to the lyrics of two songs about Alexander the Great and R101 story, which both have nothing to do with music benefits, the focus of this learning element. On the other hand, it attempts to draw some interconnections with the school subject of history through these Iron Maiden songs but again this is done in a superficial manner approaching history as unconnected bits of information. The songs can function as an incentive to read and look at other resources such as their history books and really learn by connecting information into a coherent meaningful whole.

With respect to thinking processes employed, the learning element balances between higher and lower-order thinking processes. It involves students in some challenging higher order thinking in the foreign language such as inviting them to justify their answers, categorise kinds of music, analyse how music can affect a child's/adult's life, create their favorite song's video clip. At the same time, it involves students in many lower-order thinking processes, which are not intellectually challenging enough for learners, such as choosing their favorite song, identifying the correct answer in questions while listening to some songs, writing the story of R101 that they hear in a song, making a list of the reasons why people listen to music.

iv.   Differentiated

Finally, H2's after EDIT learning element is differentiated to a greater extent than before EDIT. In particular, the learning element provides learners with

a) a variety of learning pathways such as different learning styles, i.e. thinking, experiencing and applying, and modalities. In particular, visual input such as

322

video watching, audio input such as listening to several songs, spatial processing of information such as filling in a concept map, and tactile student output such as playing their favorite song or creating a video clip.

b) opportunities for learner autonomy through options offered at different points throughout the learning element (Experiencing the Known & Applying Creatively) and self-reflection by thinking of the impact that music and songs have had on their personal life. On the other hand, the analysis also reveals the use of language that is characteristic of teacher transmissiveness with the use of the modal 'should' and the use of present simple. For example, in the learning element rationale the teacher writes 'Students' attention is drawn to lyrics because they matter. They should embrace it fully since lyrics…', or the Experiencing the New section starts by writing 'Students begin to understand that music is not just for entertaining reasons..' taking for granted what students have understood or acknowledged because that is the teacher's intention .

c) opportunities to learn with others. In particular, it involves learners in a debate after being divided into two groups (Analysing Critically) and sharing their ideas by acting a dialogue (Applying Appropriately).

9.2.7. The case of I2 teacher

I2 is an EFL secondary school teacher teaching at a Greek General Junior High School. Her first learning element, before EDIT, is based on the Advanced level version of the 1st grade Think Teen school book, and, in particular, Unit 3 entitled 'Teen Matters', Lesson 2 entitled 'My problem sorted', page 35-36 (see Appendix 18). It was a 45 minute learning element stating the following *aims:*

> *Skimming a text for general understanding , scanning a text for specific information, presenting and using language of giving advice, analyzing a model text, making a plan for writing a letter of advice, using a spider gram for brainstorming ideas.*

It was a lesson about giving advice. In particular, it was built around the course book's listening task, where three teenagers called Teen Helpline to talk about their problem and asked for advice and the course book's reading text about an Agony Aunt's answer to one of the teenagers. The learning element followed the warm-up / reading /vocabulary / writing structure of the book. In particular, there was a) a warm-up task, where students were asked to recall the three teenager problems, which they had already listened to, with no further specifications on the time and place that the listening took place, b) a pre-reading task, where the teacher explained to students what an Agony Aunt is, c) skimming for general understanding task, where students were asked to find out to which of the three teenagers the Agony Aunt was responding to and what was the problem, d) scanning for specific information, where students were asked to find out what particular advice the writer gave, e) vocabulary presentation and practice task focusing on the language used in the text for giving advice, f) making a plan for writing a letter of advice, where students were asked to use the reading text as a model to prepare for their own letter of advice writing, g) making a spider-gram and brainstorming ideas, where students were facilitated to write down their ideas on the advice they would give to a fourth teenager and the results this advice would have, and finally g) a follow-up stage, where students actually wrote the letter of advice.

On the other hand, her final after EDIT learning element was based on the Beginner's version of the 2nd grade Think Teen schoolbook, and in particular, Unit 1 entitled 'I'm only human', Lesson 1 entitled 'Tribes of the forest', page 4 (see Appendix 26). Nevertheless, I2 chose to use the course book text only as part of a larger conceptual whole, which she entitled 'Rainforest' focusing on the Amazon's rainforest destruction which takes place year after year and constitutes a global issue of environmental concern. Thus, the teacher chose her own material, i.e. a short video about the Amazon rainforest, an article adapted from www.natgeokids.com, along the Think Teen reading text on the tribes of the forest. The learning element, though, set no explicit aims or essential questions failing to make it clear from the beginning what was expected from students to learn and understand. It is only implicitly assumed that

the learning element aimed to help learners understand the causes and effects of the Amazon rainforest destruction.

The learning element followed an LbD structure: Experiencing the Known, Experiencing the New, Conceptualizing by Naming, Conceptualizing by Theorizing, Analysing Functionally, Analysing Critically, Applying Appropriately, Applying Creatively. In particular, it started by asking students of their own prior experience with familiar products coming from the Amazon rainforest such as bananas, avocado, coffee, sugar, spices, different medicine, wood before watching a video about the Amazon rainforest and reflect on its importance and what it is threatened by (Experiencing the Known). Then, students read a text about the Amazon rainforest and were asked to write what impressed them the most and how they felt about the fact that 51.800 square kilometers disappear each year (Experiencing the New). Then, there followed two reading comprehension activities, the one was a true/false exercise and the second asked learners to fill in a table, which was organized in categories and sub-categories, with information from the text about the Amazon (Conceptualizing by Naming). At the following stage, students read the text from the 2nd grade Think Teen Beginners on page 4 about the Amazon tribes and were asked to discuss in groups the reasons why the rainforest was important for the tribes and the rest of the world (Conceptualizing by Theory). At this learning element, the school-book text was not the focus of the whole learning element but it constituted just a part of a more coherent and thorough whole in a series of information input on the lesson's topic.

Then, students went on to discuss in groups about the causes and the effects of the Amazon rainforest destruction (Analysing Functionally), and suggested a course of action after looking at themselves and evaluating their own attitude towards the Amazon rainforest (Analysing Critically). At the final stages of the learning element, students were asked to write a letter from the perspective of someone living in the rainforest and inform the rest of the world about the dangers the Amazon tribes face due to the rainforest steady destruction (Applying Appropriately). The last task, asked from learners to design a 'Save the Rainforest' campaign with the purpose of

informing their classmates about the Amazon rainforest value, the threats it faces and the actions they could take to help.

Overall, the analysis showed that I2's lesson planning exhibited signs of growth from an undifferentiated coherent, learner irrelevant learning element building on knowledge acquisition before EDIT to a differentiated coherent, learner relevant learning element building on learner understanding (see Table 9.7.) after EDIT. The greatest changes were observed in I2's lesson planning with respect to differentiation, learner relevance. What follows is a more detailed presentation of the analysis results.

9.2.7.1. Before EDIT Analysis: *My problem sorted*

i.   Coherent

The analysis has shown that I2's learning element before EDIT following the textbook sequence of activities is a coherent learning element. The learning element sets a number of language learning processes objectives such as skimming or using a spider gram for brainstorming ideas. These objectives actually describe the language skills and strategies that the learners need to employ in order to perform the learning element's activities. The learning element coherently starts by activating learners' prior knowledge and relevant experiences. The progression of the activities is logical. In reality, it is a typical EFL learning element with a focus on learner practice of the language skills of reading and writing accompanied with vocabulary learning, i.e. language of advice. It lacks any understanding aims which would add greater meaning and challenge to the learners' language learning but it has a clear structure which makes it a coherent learning element.

ii.   Learner Irrelevance

I2's learning element before EDIT could be characterized as a largely learner irrelevant learning element. It makes no attempt to connect learners' own prior relevant experience on the topic with new learning. Instead, the learning element begins with

the re-activation of learner's knowledge of the content of the reading text, which they have come to know through a listening task sometime before this lesson. In addition, the learning element involves students in a) closed-ended tasks such as skimming and scanning with the aim to give one right answer and b) form-focused writing, where the emphasis is put on the format and language of a friendly letter using the text as a model for students to write their own similar letter of advice. That, however, leaves no much space for learner authentic and meaningful expression.

iii.   Building on Knowledge Acquisition

The analysis has also shown that I2's learning element before EDIT is a knowledge acquisition focused learning element putting emphasis on learners' acquisition of specific phrases used for giving advice and the format for writing a friendly letter. The phrases for giving advice, though, are presented as isolated bits of information not connected to any coherent meaningful whole. It is characteristic that the learning element stays narrowly focused on the 3 particular problems referred by the teenagers in the Think Teen text and the particular language used in this singular text. In the meanwhile, there are no meaningful interconnections drawn between the nature of the problems teenagers usually face, the concept of advice giving taking into account the context, the particular characteristics of the teenagers, the possible risks involved in giving advice out of context, and how all this relates to the particular learners' reality in an attempt to transfer meaningful new learning into their real life.

Finally, I2's learning element before EDIT involves learners in largely lower-order thinking processes, which are not intellectually challenging for either learner. In particular, learners are welcomed to recall information from a previous listening task at the beginning of the lesson, identify the correct answer in some reading comprehension questions, identify the advice giving language in the text and do a vocabulary practice exercise. The only challenge created for learners pertains to their involvement in figuring out three pieces of advice to a particular problem and the possible effect of that advice. Nevertheless, even this thinking process lacks any relevancy to be meaningful for learners since they are asked to give advice to a

fictional teenager while not having conceptualized in some depth Vicky' particular problem.

iv.   Undifferentiated

Finally, I2's lesson plan before EDIT is a mainly undifferentiated lesson plan. In particular,

a) it provides learners with singular learning pathways of one learning style and one modality input and processing. Learners are solely involved in thinking processes of written-linguistic input.

b) it fosters teacher directed learning leaving no room for student autonomy

BEFORE EDIT	AFTER EDIT
LOW INTELLECTUAL QUALITY	**MEDIUM INTELLECTUAL QUALITY**
Coherent • concrete language learning objectives • activation of prior knowledge & experiences • logical progression of activities: pre-reading, while-reading, follow-up (writing) • objectives achieved	**Coherent** • implicit understanding objectives • no essential knowledge explicitly identified • activation of prior experiences • logical LbD progression of activities creating a unified whole • deep understanding achieved
Learner Irrelevant ✓ new learning unconnected with prior learner experience & lifeworld ✓ closed-ended tasks aiming to get content 'right'; give one right answer	**Learner Relevant** • it starts with prior learner knowledge with respect to new learning (not learner lifeworld such as prior experiences, interests, etc) • open-ended tasks involving learner interests, experiences, feelings, perspectives, etc
Building on Knowledge Acquisition • factual knowledge; Isolated bits of info; form-focused • Work-focused; purposeless doing of exercises ○ lower-order thinking only *: Identifying*	**Building Understanding** • factual knowledge only, i.e.it emphasises specific details; not concept-based • it draws interconnections between tasks, as part of a coherent whole • some higher-order thinking: *classify, solve, figure out cause & effect, support, design*
UNDIFFERENTIATED	**DIFFERENTIATED**
	Providing a variety of learning styles *Experiencing, Reflecting, Thinking, Acting*

	Multimodal learner Input
	Visual: video
	Fostering Learner Autonomy:
	provision of options for self-reflection
	Fostering Learning with others:
	group discussions, interactive campaign addressed to their classmates

Table 9.7. I2's learning element main changes before and after EDIT

Learners are offered no options in their learning. They are offered no opportunities for self-reflection or any pathway to their own interests. Instead, teacher guides them all along the learning element in a series for tasks for them to give the right answer.

c) learners are involved in no social learning with others. All the activities involve learners in solitary individual learning.

9.2.7.2. After EDIT Analysis: *Rainforest*

i. Coherent

I2's learning element after EDIT is a coherent learning element which is exclusively designed and contrived by the teacher in order to complement the school textbook with a whole cycle of meaningful language experiences. The learning element, though, sets no explicit aims or essential questions failing to make it clear from the beginning what is expected from students to learn and understand. It is implicitly made clear that the learning element aims to help learners understand the importance of the Amazon ecosystem together with the causes and effects of its steady destruction while using a foreign language. Building on its coherence, the learning element starts by attempting to activate prior learner experiences and knowledge in relation to the topic, i.e. '(d)o you use any of the following products? Do you know where they originally come from?'. The learning element follows an explicit LbD structure whose activities progress logically building on each other deepening student understanding around essential knowledge. The final Applying Creatively task makes an attempt to transfer the lesson learning to students' real-life by asking them to design a 'Save the Rainforest' campaign staying, though, within the confines of their

classroom since it is supposed to address their other classmates, not the school or wider community, for example.

ii.   Learner Relevance

I2's after EDIT learning element in contrast to the before EDIT learning element was a more relevant to the learners learning element. At the beginning of the learning element, the teacher made an attempt to draw connections between learners' prior experience with the Amazon rainforest. Then, she attempted to activate any prior learner knowledge about the Amazon rainforest complemented with new knowledge about it through a video watching. In addition, its tasks were mainly open-ended tasks welcoming learners' impressions, feelings, self-reflections and opinions. For example, at the Experiencing the New part, the learners were asked to *'reflect on the fact that impressed them the most and their feelings about the Amazon rainforest destruction'*, and later, at the Analysing Critically part they were asked to *'evaluate their own attitude towards the Amazon rainforest and suggest a course of action'.*

iii.   Building Understanding

I2's after EDIT learning element focused on student understanding of an environmental problem, the yearly destruction of the Amazon rainforest. In essence, it attempted to draw interconnections between causes, effects and the course of action that should be taken as part of a coherent whole while it made use of different resources for richer learner input, i.e. two texts and a video. It should be noted, though, that it focused on the specific facts about the Amazon rainforest without going deeper by drawing connections with broader concepts such as environmental ecosystems, or identifying similarities and differences with other environmental issues, or drawing connections with the dangers other forests in Greece or worldwide face. On the other hand, the learning element involved learners in some higher-order thinking, which is intellectually challenging. For example, it invited learners to classify the information read in the text (Activity 6), to explain the importance of the rainforest (Activity 7), to figure out the cause and effect of its yearly destruction (Activity 8), to

apply their understanding in thinking of a course of action (Activity 9), and to create a campaign for the rainforest (Activity 11).

iv.   Differentiated

Finally, I2's after EDIT learning element was a differentiated learning element. In particular, the learning element provided learners with

a) a variety of learning pathways such as different learning styles, i.e. thinking, experiencing, reflecting and applying, and modalities referring mainly to visual input such as video watching .

b) opportunities for learner autonomy through opportunities offered for self-reflection. There were no options offered to learners or entry points designed for the inclusion of learner interests related to new learning.

c) opportunities to learn with others. In particular, it involved learners in group discussions (Conceptualising with Theory, Analysing Functionally), and the design of a real-life interactive campaign about saving the rainforest addressed to their classmates (Applying Creatively).

9.2.8. The case of K2 teacher

K2 is an EFL secondary school teacher teaching at a Greek General Junior High School. Her first learning element, before EDIT, was based on the Advanced level version of the 1st grade Think Teen school book, and, in particular, Unit 5 entitled 'Times Change', Lesson 1 entitled 'Fancy ancient history?', page 68-69 (see Appendix 19). It was a learning element built around the Vocabulary Link and the Grammar Link section exercises. In reality, it was a 45-minute learning element stating no learning aims or objectives. In particular, the learning element followed the following structure: a) an exercise where students revised the verb 'to be' in its simple past form while the teacher explained the unknown words, b) a speaking task where the teacher asked learners 'what additional information they knew' about the people in Activity 1 of the Vocabulary Link, a matching activity of people who made history such as Socrates,

331

Napoleon and a short description of who they are such as a Greek philosopher, a French general. Then, students were invited to guess whether they lived before or after Christ was born, c) the teacher explained the meaning of AD and BC and then students were asked to use the two acronyms and fill-in the gaps in two short sentences, d) students did another vocabulary exercise, , Activity 3, with collocations, e) students read an example sentence on page 69 and from that sentence they tried to elicit the rule about relative pronouns, and finally, f) students practiced grammar, i.e. relative pronouns, by doing Activity 2 of the Grammar Link is another matching activity, which could be used from students in order to make up some relative clauses. .

On the other hand, K2's final after EDIT learning element was not based on the schoolbook. Instead, K2 chose to design a learning element of two teaching periods about the topic of Artificial Intelligence (AI) and its biased learning from humans (see Appendix 27). The learning element set no explicit understanding aims and objectives or identified no essential knowledge. It could only implicitly be inferred that the aim of the lesson was for students to explore whether AI could be truly objective and unbiased. In addition, there was no specification of the grade or the language level of the students it addressed. The material on which it was based had been chosen by the teacher and involved two reading texts, one untitled, the second with the title 'Just as we learn our biases from the world around us, AI will learn its biases from us'. The learning element followed an LbD structure: Experiencing the Known / Conceptualizing by Naming, Experiencing the New, Analysing Critically, Experiencing the Known / Conceptualizing by Naming, Conceptualizing with Theory, Analysing Critically.

It started by asking learners to give the definition of Artificial Intelligence and some examples of it. The next task involved learners in using Google to translate a series of two-word sentences from Greek into English to find out that '*although most of the original sentences are neutral as to gender, the text in the target language is assigned a specific gender or even the opposite gender of the source text*'. Then students were asked to explain what the reason was for '*that misrepresentation of the occupations in Greek*'. The following question was '*What is bias? What is prejudice?*'. After a short

discussion on the meaning of bias and prejudice, learners were asked to read some statements about the unbiased nature of modern technology and AI and discuss whether they agree or not. Then students read a text about how AI learns its biases from us. The learners were asked to answer some comprehension questions, do some exercises, i.e. matching vocabulary with their definitions and fill in the gaps with the correct words. The final task of the learning element, Applying Appropriately and Analysing Critically, involved learners in a discussion of '*the probable repercussions of relying too much on artificial intelligence for dealing with different aspects of our lives*'.

Overall, the analysis showed that K2's lesson planning exhibits signs of growth from a mainly undifferentiated incoherent, learner irrelevant learning element building on knowledge acquisition before EDIT to a slightly differentiated semi-coherent, semi learner relevant learning element building partially on leaner understanding (see Table 9.8.) after EDIT. The greatest change refers to the teachers' involvement in designing her own understanding-focused learning element, even though it is not yet a learning element of high intellectual quality. What follows is a more detailed presentation of the analysis results.

9.2.8.1. Before EDIT Analysis: *Fancy ancient history?*

i. **Incoherent**

K2's learning element before EDIT is not a very coherent or well-thought out learning element, even though, is wholly built around the school-book exercises. It is indicative that K2 in her learning element writes no explicit language learning or understanding aims or objectives for her lesson. In reality, learners are asked to do one activity after the other in a quite incoherent manner starting with revision of the simple past form of the verb 'be', do some speaking, then learn some vocabulary involving the meaning of AD and BC and some collocations, to go one with the elicitation of the grammar rule for relative pronouns and do some relevant grammar exercises. It is important to note that the vocabulary work they do, which involves mainly teacher explaining the meaning of the words, is restricted only to the vocabulary of the textbook activities,

which renders vocabulary learning quite mechanical and unproductive. In a similar line, the grammar work is restricted to the exercises of the book where students are asked to elicit a grammar rule by reading a limited number of sentences in the relevant textbook sections and then practice the rule by again completing appropriately a grammar activity. With regards to learners' speaking practice, there is no preparation or warm-up stage involved to engage learners and build on the speaking task. Instead, learners are asked what additional information they know about the people they read on the textbook and guess whether they lived before or after Christ was born. Such a knowledge question cannot involve or engage all learners in the speaking practice because it depends on their previous knowledge background, and at the same time, guesswork about whether they lived before or after Christ can only invite students' one-word answers.

ii. Learner Irrelevance

K2's learning element before EDIT can be characterized as a learner irrelevant learning element since it is not connected to the learners' lifeworld. It makes no attempt to connect new learning to any prior and meaningful learner related experiences. Instead, the learning element begins with a grammar revision exercise, which aims at student recalling of their grammar knowledge, and, then, goes on with teacher explaining new vocabulary as isolated bits of information unconnected to the learner lifeworld. What is more, all the tasks are closed-ended requiring one 'right' grammar or vocabulary related answer instead of welcoming learner experiences, perspectives, interests, feelings, etc. for language work to build on.

iii. Knowledge Acquisition

K2's before EDIT learning element strongly builds on learners' knowledge acquisition. New learning refers mainly to isolated bits of information such as the unknown words of the initial activity, the meaning of AD and BC, some collocations and then the grammar rule of relative pronouns. All this knowledge appears essentially as unconnected knowledge of the lesson activities' vocabulary and a grammar rule, and,

thus, possibly meaningless to learners. In addition, learners are involved in lower-order thinking processes of no intellectual challenge such as recalling previous information and memorizing new.

i. Undifferentiated

Finally, K2's learning element before EDIT is an undifferentiated learning element. In particular,

a) it provides learners with singular learning pathways of one learning style and one modality input and processing. Learners are solely involved in thinking processes of written-linguistic input.

BEFORE EDIT	AFTER EDIT
LOW INTELLECTUAL QUALITY	**MEDIUM INTELLECTUAL QUALITY**
Incoherent • implicit language learning objectives • no activation of prior knowledge • uneven progression of activities • rote learning achieved	**Semi Coherent** • implicit understanding objectives set • activation of prior learner knowledge • uneven logical LbD progression of activities • partial understanding achieved
Learner Irrelevant ✓ new learning unconnected with prior learner experience & lifeworld ✓ closed-ended tasks aiming to get content 'right'; give one right answer	**Semi-Learner Relevant** ✓ it starts with prior learner knowledge with respect to new learning (not learner lifeworld such as prior experiences, interests, etc) ✓ closed-ended tasks aiming to get content 'right'; give one right answer ✓ no Transfer to Real Life
Building on Knowledge Acquisition • factual knowledge; isolated bits of info • work-focused; purposeless doing of exercises ○ lower-order thinking : *recalling, guessing*	**Building Partial Understanding** • concept-based • some interconnections drawn at a superficial level • some higher-order thinking : explain, illustrate, figure out cause & effect
UNDIFFERENTIATED	**DIFFERENTIATED**
	Providing a small variety of learning pathways *(Experiencing, Thinking)*
	Partial learning with others *(discuss at the end)*

Table 9.8. K2's learning element main changes before and after EDIT

b) it fosters teacher directed learning leaving no room for student autonomy. Learners are offered no options in their learning. There are offered no opportunities for self-reflection or any pathway to their own interests. Instead, teacher guided them all along the learning element in a series of tasks for them to give the right answer. For example, the teacher explained the vocabulary, or she elicited the grammar rule from one example sentence.

c) learners are involved in no social learning with others. All the activities involved learners in solitary individual learning.

9.2.8.2. After EDIT Analysis: *Biases in Artificial Intelligence*

i. **Semi-coherent**

K2's after EDIT learning element is a semi-coherent learning element, which is not based on the textbook but wholly conceived, planned and resourced by the teacher. The learning element sets no explicit understanding aims and objectives and identifies no essential knowledge. It can only implicitly be inferred from the structure and content of the tasks that the aim of the lesson is for students to explore whether AI could be truly objective and unbiased. The progression of the activities is a bit uneven not always very effectively building on each other. In particular, the beginning of the learning element is particularly uneven taking some time for the learners to understand the purpose of the tasks and how they connect together. For example, it abruptly starts by asking learners to give the definition of AI and some examples of it without any previous preparation on the topic, and one of the following core questions asks them about the meaning of bias and prejudice, two unrelated concepts to AI. The rest of the learning element builds around some reading texts referring to the concepts of AI and biases, which are the focus of this learning element attempting to draw some implicit connection between the two. The final task quite effectively draws these two together and invites learners to express their developed understandings and opinions on the matter of 'the probable repercussions of relying

too much on artificial intelligence' due to its 'learning our deeply-rooted prejudices from the data we give it'.

ii.   Semi-Learner Relevant

K2's after EDIT learning element is a largely learner irrelevant learning element. The analysis has revealed teachers' growing development and attempt to invite student thinking and perspective into their learning. A characteristic such example was the task where students were asked to express their agreement or disagreement with the statements about unbiased technology justifying their answer (Activity D) and the two open-ended questions at the end of the learning element where students were asked to express their opinion on the negative impact of AI learning and discuss. On the other hand, it makes no attempt to connect learners' prior experiences with technology or AI with this lesson's learning. Instead, it assumes that all learners know what AI is and so asks them to define it and give some examples. In addition, the great majority of the tasks are closed-ended tasks expecting from learners to give one right answer. Characteristic examples are the reading comprehension and the vocabulary exercises, or the definitions expected from learners of 'AI', 'bias' and 'prejudice'.

iii.   Building Superficial Understanding

K2's after EDIT learning element attempted to focus on and superficially built learner understanding. It was built around some broad concepts such as AI, bias and prejudice. Nevertheless, it did not explore either the concepts per se or their interconnections in depth for learners to reach deep and transferrable understandings into their real life. Learners were asked to give definitions of the main concepts without any work done on learner conceptualization of the concepts through rich input and examples, or higher-order thinking. In addition, the connection between AI and biased learning was only superficially touched upon through the information found in the reading text. No further questions were made to facilitate learners' own meaning construction. A singular instance of learner involvement in higher-order thinking referred to the very last task where learners were asked to analyse critically the impact of prejudiced learning in AI. The main body of the learning element

involved learners in lower-order thinking processes, even if otherwise stated, which merely required from the knowledge recalling of prior knowledge and identifying the right answer.

The learning element attempted to employ the LbD knowledge processes, which was not done very effectively, revealing teachers' poor understanding of the nature of the LbD knowledge processes. For example, the very first task asking learners to define AI, purported to employ Experiencing the Known and Conceptualizing by Naming processes, when in essence, it involved learners in pure intellectual conceptualization work making no room for learners' own lifeworld experiences. Another example refers to the questions, 'What is bias? What is prejudice?', where the teacher purported to involve learners in again Experiencing the Known and Conceptualizing by Naming processes, where in reality learners were not given any input to be able to construct some meaning, rendering the task a mere recalling activity of any previous knowledge. The only example of an effective use of the LbD knowledge processes refers to the final task of the learning element, Applying Appropriately and Analysing Critically, where learners are involved in a discussion of 'the probable repercussions of relying too much on artificial intelligence'. This task indeed involved learners in a critical analysis of AI in our everyday lives.

iv.   Differentiated

Finally, K2's learning element after EDIT was only slightly differentiated. In particular,

a) it provided learners with limited learning pathways of a few learning styles, i.e. thinking and experiencing Google translation, and one modality input and processing, i.e. written-linguistic input.

b) it fostered teacher directed learning leaving no room for student autonomy. Learners were offered no options in their learning. They were offered no opportunities for self-reflection or any pathway to their own interests. Instead, teacher guided them all along the learning element in a series for tasks for them to give the right answer. It was characteristic that the teacher expected from students particular answers, implying that she indirectly or directly

guided students to give her that answer. For example, at the first task she wrote *'The teacher asks students to give him examples of artificial intelligence. Among the examples is machine translation'*.

c) learners were involved in some social learning with others when they were invited twice in this lesson to discuss with others a) whether they agreed with the statements read (Activity D), and b) at the end of the learning element the negative impact of biased AI.

9.3. A comparative analysis of all teacher cases

Comparative analysis of the results of each teacher's change showed that all teachers' (8 teachers, 100%) designs after EDIT were more meaningful designs building on student understanding. In particular, more than half of teachers (5 teachers, 62,5%), who designed learning elements building on students' knowledge acquisition before EDIT, after the program managed to design learning elements which were partially building on understanding. A few teachers (2 teachers, 25%), who designed learning elements building on students' knowledge acquisition before the program, managed after EDIT to design learning elements which were building on students' understanding in a high-quality manner, and one teacher (1 teacher, 12,5%), who designed a semi-understanding learning element before EDIT, managed to design a high-quality understanding learning element after EDIT. All teachers' (8 teachers, 100%) designs after EDIT also used a variety of learning styles in contrast to their before EDIT learning elements which involved learners largely in the thinking style of learning. In essence, the adapted LbD template must have contributed greatly in facilitating teachers design meaningful learning elements and use various learning styles, such as experiencing, thinking, reflecting and acting.

The great majority of teachers' (7 teachers, 87,5%) lesson designs after the program were also more relevant to the learners and differentiated employing multiple modalitie. In particular, with respect to teachers who designed learner irrelevant learning element before EDIT, half teachers (4 teachers, 50%) managed to design semi-learner relevant learning elements after EDIT, while a few teachers (3 teachers,

37,5%), revealed a greater change designing learner relevant designs after the program. Only one teacher (C1) (1 teacher, 12,5%) showed no change since her lesson designs were learner relevant both before and after EDIT. In a similar line, more than half of teachers' (5 teachers, 62,5%) undifferentiated designs before EDIT were differentiated after EDIT, while a few teachers' (2 teachers, 25%) partially differentiated designs before were differentiated along more variables after the program. Only one teacher (B1) (1 teacher, 12,5%) showed no change since her lesson designs were differentiated both before and after EDIT. The aspect of differentiation which teachers most readily employed after EDIT apart from the variety of learning styles, was the use of different modalities. Half of teachers' (4 teachers, 50%) designs revealed a great change from the use of one modality, the linguistic one, before EDIT to the use of various modalities after EDIT, while a few teachers (3 teachers, 37,5%) did use the visual mode along with the linguistic one before EDIT, enriching them with even a greater variety after EDIT. One teacher (K2) (1 teacher, 12,5%) continued to employ one modality even after EDIT.

The majority of teachers (6 teachers, 75%) involved learners in learning with others after EDIT, a learning pathway that was absent in the before EDIT learning elements. Only a few teachers (2 teachers, 25%) did employ learning with others both before and after EDIT. What is more, more than half of teachers' (5 teachers, 62,5%) designs after EDIT became more coherent and learner autonomy supportive. In more detail, more than half of teachers (5 teachers, 62,5%), whose designs before EDIT made no effort to support learner autonomy, became more learner autonomy supportive after EDIT offering learners choices and opportunities to self-reflection. Only one teacher's (C1) (1 teacher, 12,5%) designs were supportive of learner autonomy both before and after EDIT, while a few teachers (2 teachers, 25%) made no attempt to support learner autonomy neither before nor after EDIT. With respect to lesson coherence, a few teachers (3 teachers, 37,5%), who taught incoherent learning elements before EDIT, designed semi-coherent learning elements after EDIT, while a few teachers (2 teachers, 25%), who designed semi-coherent learning elements before EDIT, managed to plan coherent learning elements after the program. A few teachers (3 teachers, 37,5%) designed coherent learning elements both before and after EDIT.

9.4. Conclusion

The analysis of teachers' before EDIT one-hour learning elements revealed that the aims and objectives that the teachers set focused solely on language learning with an emphasis on language skill development. On the other hand, the after EDIT learning elements, which were usually of longer duration, set aims and objectives that focused solely on learners' understanding of a wide variety of essential knowledge concerning the arts, immigration, the environment, healthy food habits, hate crimes, etc. In other words, they specified no explicit language learning aims and/or objectives in connection to the Integrated Foreign Languages Curriculum. This is largely due to EDIT, which did not place great emphasis on how teachers could handle language learning objectives in the context of an understanding-focused learning element. This could be the focus of a third LbD cycle after teachers understood and were familiarized with the principles of high-quality differentiated lesson design since effective learning can only built on prior knowledge.

It is important to note, though, that despite the absence of explicit EFL aims and objectives, the after EDIT learning elements involved learners in meaningful and relevant learning using English as a medium enriched by a wide variety of modes and a very rich input of the foreign language through multiple sources and a wide variety of reading texts and videos. What is more, learners were involved in more meaningful speaking, often in the form of negotiation, and writing tasks facilitating, that way, a more effective EFL skill development. In parallel, the higher order processes employed in the after EDIT learning elements drawing connections among concepts and organizing knowledge hierarchically is generally an effective means of vocabulary learning in a foreign language since concepts and words can be better memorized.

Overall, the analysis also revealed that all teachers' designs at the end of the program indicated teachers' growing ability to design high-quality and differentiated learning elements. Teachers' lesson designs before EDIT were based on the school textbook sequence of activities following the conventional EFL tradition of skill development building, i.e. Pre-reading, While-reading, Post-reading activities. These were largely

incoherent or semi-coherent irrelevant to the learners' learning elements with a focus on learners' knowledge acquisition. Only a few learning elements were partially differentiated, while the majority were undifferentiated involving learners in singular learning pathways, i.e. the learning style of thinking, the linguistic and rarely the visual modality, not supportive of learner autonomy or learning with others. Only a few teachers involved learners in social learning and gave their learners different language proficiency level options.

In contrast, after EDIT all teachers' designs were more meaningful building on student semi- or high-quality understanding and employing a variety of learning styles, i.e. experiencing, reflecting, thinking, acting. The great majority of teachers' learning elements were also more relevant to the learners and differentiated using multiple modalities such as linguistic, logical, visual, auditory, tactile-spatial. The majority of after EDIT learning elements also involved learners in learning with others processes such negotiating, sharing and interacting with others in pair and group work. Finally, more than half of teachers managed to design more coherent learning elements supportive of learners' autonomy. In reality, teacher change was gradual and took time while it built on teachers' prior knowledge. That is why, the trend was for teachers' growth to move successively from low intellectual quality to semi-intellectual quality to high-intellectual quality indicators.

The LbD template is considered to have played a determining role in facilitating teachers design meaningful learning elements making use of varied learning styles. Interestingly, though, the analysis showed that teachers were more apt in the implementation of the LbD processes with which they were already more familiar such as the processes of Conceptualising, Experiencing the New and Analysing. These knowledge processes to a large extent represent processes that the traditional school uses more often. In contrast, the teachers seemed to have greater difficulties with the more open and creative implementation of Experiencing the Known, which welcomes learners' lifeworld into learning, and Applying Creatively, which allows for transfer of learning into learners' lifeworld in creative ways. Almost half of teachers seemed hesitant to invite learner experiences on the taught topics, which would make learning

more relevant to learners, sticking mainly to what they had been more familiar with, that is, the activation of learners' prior knowledge such as vocabulary on the taught topic. In the same manner, in the Applying Creatively stage they usually stuck to their more familiar task of involving learners in creative writing tasks instead of transferring learners' learning outside the classroom.

To sum up, EDIT has been a successful program helping teachers develop deep understandings of the principles of high-quality differentiated lesson planning and be able to transfer those in their classroom designs. The following and final chapter wraps up the analysis results of both the questionnaires and the learning elements discussing in conclusion the participant teachers' experience with EDIT and its effectiveness in transforming teacher mindsets and developing their ability to design high-quality differentiated learning elements. Overall, the aim of the chapter is to discuss generated new knowledge and understandings of what makes effective TPD on DI that can be transferred to other settings. The chapter also addresses the study limitations together with direction for future research on the subject.

Chapter 10:   Discussion

10.1. Introduction

The main objective of this study is to explore the answer to the central research question of what makes effective teacher professional development for differentiated instruction. The research synthesis of the second chapter resulted in an original reframing of differentiated instruction consisting of three differentiation levels in the form of a pyramid, a) the affective level, b) the planning level, and c) the instructional level. The first two levels, which are the focus of this study, are considered foundational for the third level to build on. This differentiated instruction pyramid resulted in the identification of two core teacher competences, which are hypothesized to constitute the expected outcomes of any foundational teacher professional development program on differentiated instruction, a) teacher openness to diversity and b) the teacher ability to plan a high-quality differentiated learning element. The third chapter explored Learning by Design (Kalantzis and Cope, 2004), a polyvocal pedagogy of knowledge processes, complemented with Understanding by Design (Grant Wiggins and Jay McTighe, 2005), which are suggested to be useful and complementary tools for helping teachers design high-quality differentiated learning elements. The fourth chapter focused on teacher professional development on differentiation using transformative learning (Mezirow, 1996; 1997) as a general framework and proposing another original synthesis of *polyvocal transformative* teacher professional development on differentiation grounded on the DI principles developed in Chapter 2. This polyvocal teacher professional development framework assumes that for effective teacher professional development on DI, teachers need to i) experience DI, a new learning paradigm, and engage in transformative processes of reflection, ii) reach deep understandings and learn within a community of practice culture of differentiated education through multiple learning pathways, and iii) meet their own basic affective needs for competence, autonomy and belonging.

This PhD study's propositions about DI and polyvocal transformative teacher professional development on DI were used to design in the context of this research *Exploring DI Together* (EDIT), a 12month asynchronous online teacher professional development program for DI, which was implemented in the Greek context in a sample of 11 English as Foreign Language secondary school teachers (see chapter 5). The polyvocal transformative design of EDIT was facilitated by the use of two learning element design tools, the Understanding by Design and the Learning by Design frameworks. The methodology used (see chapter 6) to test the study's propositions of what makes an effective teacher professional development program on differentiated instruction is that of an evaluative case study, an insider research where the researcher was at the same time the teacher educator and designer of EDIT, using three questionnaires with closed and open-ended questions that were developed and distributed to the teachers at the beginning, the middle and the end of the program and the learning elements that the teachers designed at the beginning and the end of EDIT.

Following a program logic, chapters 7 to 9 answer the three research questions, which explore i) the nature of the participant teachers' experience with EDIT (see chapter 7), ii) EDIT effect on teacher professional development on DI, i.e. teacher mindset change towards greater openness to diversity (see chapter 8) and iii) the development of the participant teachers ability to design high-quality differentiated learning elements (see chapter 9). This final chapter (chapter 10) summarizes and discusses the research findings answering the research questions of the study, which is situated within a context of scarce research on teacher professional development on DI, a learner-centered education that is holistic, complex and challenging for teachers to implement in their classrooms. The chapter ends with the implications of the research, its limitations, some suggestions for EDIT improvement and some recommendations for future research on teacher professional development on DI.

10.2. The participant teachers' openness to diversity before EDIT

This section presents the findings that depict the participant teachers' profile with

respect to their degree of openness to diversity before any intervention took place drawing the relevant findings from the chapters (see chapters 8 & 9) that explored the answers to the 2nd and 3rd research questions asking how effective EDIT has been in transforming the 11 participant teachers' frames of reference and in developing their ability to design high quality differentiated learning elements. The methodology used included the three questionnaires, which were analyzed using descriptive statistical analysis (see 8.2.1) for the quantitative part and qualitative and quantitative content analysis (see 8.2.2.) for the qualitative part, and the teachers' learning elements before EDIT. It is important to note that EDIT teachers were a quite diverse sample coming from different school contexts ranging from Experimental Model High Schools to General Junior High Schools, a general senior high school, a teacher working in an Intercultural Junior High School and a teacher working in a Technical Senior High School, which has important implications for the diversity of their needs with respect to their school context life-worlds.

What the findings (see 8.2.1 and 8.2.2) indicated is that the great majority of the participant teachers (9 teachers, 82%) even though highly qualified and experienced, inspired by humanistic learner-centered education, purporting already differentiating themselves, in practice they could not escape the implicit traditional and predominant educational paradigm of instrumental learning. This finding agrees with research (Tzanni, 2018; Vodopija & Pajalic, 2016) that shows that despite EFL teachers being aware of student differences and familiar with DI, there is a gap with their actual EFL practice. The qualitative analysis (8.2.2) showed that the great majority of the participant teachers (9 teachers, 82%) were inspired by humanistic teaching ideals acknowledging the importance of DI and setting learner centered aims such as developing learner autonomy or motivating students. However, despite their high qualifications, the emerging theme from the analysis was that of teachers putting the onus for learning on students assuming no responsibility for their learning (see 8.2.2.1). The analysis revealed that the main assumption underlying the majority of teachers' responses (7 teachers, 64% in 14 meaning units) in the questionnaires was a simplistic conception of teaching where learning and motivation happen

automatically in the context of linear one-way teacher-student interactions assuming that the teacher directly causes learning by:

a) simply telling something to students,

b) giving material and tasks to them,

c) making use of certain methods and tools,

d) asking different questions to advanced and struggling students,

e) giving different instructions,

f) varying the length of time, and

g) using both languages, English and Greek.

These findings reveal that the participants' reported perceptions and practices were underlain by traditional linear transmissive and controlling teaching assumptions due to the *unquestioned grammar of teaching* (Hargreaves, 2000 citing Tyack and Tobin, 1999), i.e. the pervasiveness of instrumental learning in education (see 4.4). These findings agree with Scweisfurth's (2016) study of learner centered education implementation globally and studies in Greece (see 4.4), revealing that teachers fail to make the paradigm shift to a learner-centered education. This connects to beliefs research, which contends that teachers' practice is actually determined by the implicit beliefs they hold (Karavas-Doukas, 1996). As a result, any innovative teaching method or ideas they learn about end up to be translated through the distorted lens of prior didactic-based educational beliefs and are adapted to fit the already existing teaching practices (Thompson and Zeuli, 1999 in Neville, 2006; Karavas-Doukas, 1996). This is actually a struggle for paradigm change calling for the need for transformative learning principles in any teacher professional development on DI, that is, making those tacit unconscious assumptions, or else, tacit frames of reference, explicit for any change to take place (Mezirow, 1996; 1997; Calleja, 2004). What is more, these findings agree with research suggesting the need for teacher professional development on differentiated instruction with carefully designed and intensive programs since it is a challenging process (Smets and Stuyven, 2020), where teachers cannot be naively assumed that if they get some information about differentiation, they will be automatically ready to practice it.

347

From the analysis of this study's data, it is inferred that there is an implicit relationship between teachers' instrumental learning assumptions and their differential treatment of advanced and struggling students, which supports the study's proposition for the need to develop teachers' openness to diversity in order for them to be able to differentiate instruction effectively. For example, the qualitative analysis revealed teachers' differential treatment of students of different achievement levels before EDIT in a fixed-mindset and stereotypical manner holding lower expectations for struggling learners and higher expectations for advanced learners (8.2.2.2). The great majority of teachers (8 teachers, 73%) put the onus for learning on struggling students while the vast majority of teachers (10 teachers, 91%) were willing to create the appropriate learning conditions assuming more responsibility for advanced students' learning. These findings indicate teachers' fixed mindset agreeing with Haimovitz & Dweck's (2017) research, which revealed that teachers who cultivate fixed mindset classrooms focus on person and ability and tend to communicate lower expectations for students who initially performed lower than others and higher expectations for students who initially performed high.

The analysis further revealed that before EDIT half of teachers (5 teachers, 45%) took into account student diversity such as interests, needs, learning style in agreement with their humanistic teaching orientation, while half of teachers (5 teachers, 46 %.) focused solely on students' different language levels (see 8.2.2.2), which reveals a restricted perception of diversity with a focus on student performance. Kumar and Hamer's (2012) research claim that teacher non-openness to diversity is underlain by stereotypical thinking and fixed mindset and it is closely interrelated to teacher non-openness to interacting with their students and to teaching practices, which do not meet all student needs. In fact, the results of the statistical analysis (8.2.1) showed that the teachers' least frequently used practices related to core DI learning processes such as a) learning with others using purposeful grouping of students, and b) student autonomy support, i.e., offering choices which would take into account different learning preferences and interests.

The analysis of teachers' lesson designs before EDIT (see 9.2 & 9.3) also reflected their mainly instrumental learning assumptions. These designs were based on the school textbook sequence of activities following the conventional EFL tradition of skill development building, i.e. Pre-reading, While-reading, Post-reading activities. These were largely incoherent (3 teachers, 37,5%) or semi-coherent (2 teachers, 25%) irrelevant (7 teachers, 87,5%) to the learners' learning elements with a focus on learners' knowledge acquisition. Only a few learning elements (3 teachers, 37,5%) were partially differentiated, while the majority were undifferentiated (5 teachers, 62,5%) involving learners in singular learning pathways, i.e. the learning style of thinking, the linguistic and rarely the visual modality, not supportive of learner autonomy or learning with others. Only a few teachers (2 teachers, 25%) involved learners in social learning and gave their learners different language proficiency level options.

10.3. Teacher experience with EDIT

The 1st research question of the study, 'how did teachers perceive the experience of EDIT?' aimed to explore whether EDIT succeeded in creating the study's purported conditions and processes for effective polyvocal transformative teacher professional development on DI. The underlying rationale of teacher professional development on DI developed in this study is that any one-dimensional approach to teacher professional development would most probably fail to capture and address the demands of effective teacher change, which should take into account the hegemony of instrumental learning assumptions, teachers' needs, and the complexity of the process of teacher professional development per se. This study's main proposition builds on the assumption that teachers first and foremost need to experience this new learning paradigm of DI and learn within a culture of differentiated education through multiple learning pathways in order to be able to teach for diversity effectively. It is also hypothesized that both transformative and meaningful learning aims and processes would play a determining role in teacher change from an undifferentiated to a differentiated and inclusive frame of reference.

To start with, EDIT emerged as an inherently transformative program (see 7.4.1). Teachers' answers to the open-ended survey questions identified two main EDIT transformative processes. Firstly, the majority of teachers (7 teachers- 64%) described EDIT as a springboard for constant reflection (see 7.4.1.), which is the third most intensively described EDIT quality (with 25 meaning units – 9,3% out of the total 268 meaning units), making an explicit reference to their involvement in:

    a) processes of self-reflection,

    b) reflection on their teaching practice,

    c) reflection on teaching and learning stereotypes, and

    d) reflection on the relation between teachers and students.

The results indicated a direct relation between the process of reflection, the area of its focus and its effect on teacher change since in accordance to the above results the analysis of teachers' own reports (see 7.4.1.) revealed that EDIT managed

    a) to turn their attention to students and better understand them (7 teachers, 64%).

    b) to turn their attention to themselves and reframe their self-perceptions resulting in holistic changes in their professional development (4 teachers, 36%)

    c) to change their relationship with some of their students or whole classes (3 teachers, 27%)

    d) to reframe their teaching practice (2 teachers, 18%).

Secondly, teachers described EDIT as an innovative experience (7.4.1.) unlike anything else and away from the mainstream, which is the fourth most intensively described EDIT quality (with 21 meaning units – 7,8% out of the total 268 meaning units). The analysis showed that half of teachers (6 teachers, 55%) experienced as new both their differentiation experience and their own successful DI implementation experiences in their classrooms with their students, half of teachers (6 teachers, 55%) referred to the creativity of EDIT tasks with an emphasis placed on the Ted talks they watched, while a quarter (4 teachers, 36%,) referred to the novelty of EDIT content. This finding

supports one of the main study propositions that teachers need to experience the new learning paradigm of DI as part of an overall transformative learning approach. This fact has important implications for teacher professional development on DI taking into consideration that teacher training offered to Greek teachers usually constitute two-hours informative in nature meetings (Georgiadou, 2011). The analysis of the participant teachers' demographics and previous experience with teacher professional development drew the same reality since the majority of the participants (9 teachers, 81,8%) did not feel adequately trained in DI due to the overly theoretical nature of professional development programs with no focus on practice (teachers 5, 55,6%) followed by lack of opportunities to work and discuss with colleagues (4 teachers, 44,4%) (see 7.2.2).

EDIT was also reported by the participants to be a thoroughly planned meaningful curriculum focusing on understanding differentiation and drawing multiple connections among concepts (see 7.4.3.), the second most intensively described EDIT quality (with 31 meaning units – 11,5% out of the total 268 meaning units) in teachers' accounts of their EDIT experience. The majority of teachers (7 teachers - 64%) described themselves as having been involved in processes of active meaning making working thoroughly on understanding: i) DI, ii) what makes a high-quality curriculum and iii) the process of learning. Quantitative analysis (see 7.3.) showed that teachers in the middle of EDIT were extremely satisfied with EDIT meaningfulness, i.e. the way it drew connections to their previous knowledge (mean=8.36). Similarly, quantitative analysis (see 7.3.) showed that teachers in the middle of EDIT were very satisfied with the way it addressed essential knowledge (mean=8.00), which satisfaction increased (mean=8.36) after EDIT. Accordingly, teachers paid special tribute to the program's content and ideas, especially the 2nd LbD cycle talking about growth and fixed mindsets, vulnerability, shame, resilience, and neuroplasticity showing how the brain learns, which appeared to play a significant role for the majority of teachers in provoking their reflection and raising their awareness. In coherence with the above results, half of teachers (6 teachers -55%) described EDIT tasks as well-organized, structured, cohesive and meaningful, while the material of EDIT concentrated their attention because of its quality, multimodality, wealth and range. These findings

indicate the contributing role that both the Understanding by Design (Grant Wiggins and Jay McTighe (2005) and the Learning by Design curriculum design tools (Kalantzis and Cope, 2004) played in building a high-quality meaningful and cohesive EDIT curriculum supporting the study's relevant proposition (see 3.7.). The findings of the analysis revealed that the EDIT curriculum managed to involve teachers in processes of deep understanding and advance their learning on differentiation, a direct contribution of the LbD tool, while the identification of the crucial and critical concepts of the EDIT cycles a direct contribution of the UbD tool were a necessary and important variable of EDIT meaningfulness and the quality of EDIT tasks and material - all interrelated elements of a curriculum design.

It is important to note, though, that less than a quarter of teachers (3 teachers, 27%) would like EDIT to devote more time to DI implementation instead of what they called 'theory' (see 7.4.3.). This means that teachers would prefer to keep the Conceptualizing and Analyzing stages of EDIT shorter and devote more time to the Applying stages of the Learning by Design. Taking into consideration that EDIT was connected to teachers' practice at the Experiencing the Known and the Applying Appropriately stages of each Learning by Design cycle, this finding stresses even more the Greek teachers' need for professional development programs that focus on teachers' practice teaching them how to apply knowledge in their actual classrooms (Karagianni, 2018). This aspect of EDIT possibly contributed partly to another teacher reported characteristic of EDIT, its frustrating time aspects (see 7.4.4.). The vast majority of teachers (10 teachers, 91%) perceived EDIT as a program with frustrating time aspects including a) EDIT demands in terms of time, b) their own heavy professional and personal schedules, c) the weekly deadlines, d) the program's non-alignment with important school periods such as the final exams, and e) its long duration. The implication of this finding is that the participants would have preferred that EDIT gave greater prominence to practice instead of 'theory'. This suggestion would make EDIT less demanding for teachers by keeping the Learning by Design cycles of shorter duration but it would detract from EDIT's challenging nature since higher-order thinking of the Conceptualizing and Analyzing stages were expected to add to EDIT's intrinsically motivating nature.

What is more, EDIT managed to intrinsically motivate teachers. A feeling of inherent enjoyment and involvement with the program emerged throughout the analysis (see 7.4.2). The motivational value of EDIT is the quality that is most intensively described by teachers concentrating a total of 74 meaning units (27,5%) out of the total 268 meaning units . The findings showed teachers' satisfaction of their need for competence in EDIT due to a) its challenging tasks and content (6 teachers- 55%) and b) its utility in helping teachers achieve effective teaching in practice and address student needs– and, thus, be competent themselves (7 teachers -64%). In agreement, descriptive statistics showed that teachers were extremely satisfied (see 7.3) with the way EDIT challenged them (mean=8.45 in the middle, mean=8.27 at the end of the program). The findings of content analysis indicated teachers' satisfaction of their need for autonomy by welcoming and integrating teachers' lifeworld of everyday classroom practice into learning (5 teachers, 46%) while EDIT's strong reflective nature as it is described above, it is inferred to have contributed to teacher emancipation from unconscious constraining views (Mezirow, 1996; Calleja, 2004). In accordance, the statistical analysis (see 7.3) showed that teachers were extremely satisfied with how EDIT addressed their interests (mean=8.4 in the middle of EDIT) and very satisfied with how autonomous and self-regulated they felt (mean=7.91 in the middle). Finally, teachers' need for relatedness was satisfied to a certain degree despite the online and asynchronous nature of the community of practice. 'The community of EDIT' is the EDIT quality that teachers described with great intensity devoting enough space in their descriptive accounts and evaluating it positively (with 63 meaning units - 23,5% out of the total 268 meaning units). Half of teachers' accounts (6 teachers, 55%) focused on the affective role that the community played in their learning while a few (3 teachers, 27%) found value in feeling connected through personal sharing of experiences, anxieties and problems. Quantitative analysis depicted their gradual development of a sense of belonging to the community by the end of EDIT where teachers' rating of EDIT in connection to their sense of belonging increased from mean=6.45 in the middle to mean=7.45 at the end (see 7.3).

The EDIT community of practice emerged from the analysis as a developing online asynchronous community (see 7.4.4), where the vast majority of the teachers (10 teachers, 91%) saw a value in the role that it played in their learning. Teachers' descriptions referred to the following types of intellectual sharing and mutual learning within the community: a) teachers' thinking and understanding was enriched by exchanging ideas and opinions, and b) teachers' teaching practice was enriched through other colleagues' contributions, e.g. learning element resources. The community also had the following transformative learning function. It contributed to teachers' opening up their egocentric thinking by listening to others' different perspectives. This finding agrees with Lantz-Anderson et al.'s (2018) review, who claim that formally-organized online communities (see 4.5.) are usually supportive of reflection on teachers' work exhibiting a diversity of voices and views, greater than that found in face-to-face community meetings. These findings together with the ones mentioned above about the affective role of the community in teacher learning support the study's proposition that the use of a community of practice as a means for differentiated TPD on DI would have the potential to facilitate holistically teachers' transformative, meaningful and affective learning.

Among the factors that facilitated EDIT's community of practice effective role in teacher learning and change was teacher interaction (see 7.4.4.). The majority of teachers' descriptive accounts (8 teachers, 73%) made a direct reference to interaction as a valuable aspect of EDIT. Half of them (5 teachers, 45%) gave emphasis to their interaction with the tutor as a provider of intellectual and scholarly leadership, and half (5 teachers, 45%) to the content of other community members' messages. At the same time however, half of the teachers (5 teachers, 46%) reported the absence of direct interaction between teachers in the community. It seems that each teacher shared their opinion in the community but that took mainly the form of monologues in the context of responding to the weekly tasks without further commenting on others' posts. It is, thus, inferred that the great majority of teachers participated vicariously in the discussion and always silently reading others' comments. As Garrison and Cleveland-Innes (2005) argue meaningful engagement and cognitive presence in

a community may also include vicarious engagement by following the discussion, reflecting on the discourse and constructing meaning individually.

This finding relates to the teachers' developing sense of belonging to the community whilst not feeling safe enough to comment on colleagues, who did not know and could not see face to face (see 7.4.4). Another explanation could also be teachers' developing openness to diversity, which directly relates to communicative competence (see 4.5). Holmes, et al. (2010) argue that communities of practice are characterized by a lack of critical and/or meaningful interaction and, especially in formally-organized communities teachers seldom challenge their peers in discussions, address the content of the course or further the discussion (see 4.5.). Generally, the teacher educator was not very intrusive in how teachers chose to communicate apart from some gentle prompts from time to time and the collaborative tasks set to the community with the aim of allowing the community to develop more organically leaving teachers' greater autonomy. On the other hand, adding an element of online synchronous communication or inviting teachers to explicitly reflect on the way they communicated within the community could have helped teachers' direct interaction. Finally, the type of technology chosen for online learning influences the type of teacher engagement and practice. For example, according to (Macia and Garcia, 2016), rapid and immediate exchanges are supported by social media.

Overall, what teachers themselves identified as facilitating factors (see 7.4.4) for making use of the community were:

a) the content and material of EDIT (3 teachers, 27%),
b) the community communication, which they found easy and constructive (2 teachers, 18%),
c) the platform (1 teacher, 10%), which this teacher found easy to use, and
d) asynchronous learning (1 teacher, 10%).

Half of the teachers (6 teachers, 55%) had difficulties with EDIT's online asynchronous nature, particularly asynchronous collaboration with others. A quarter of teachers (4

teachers, 36%) explained that they found it difficult to coordinate and cooperate with the rest of the community, while others identified as a main hindrance their time availability (4 teachers, 36%), the Scholar platform which they characterized non-friendly to use (4 teachers, 36%), and the fact that they did not know each other well(3 teachers, 27%) commenting on their need for more face-to-face interaction as a means of fostering more trust between them (see 7.4.4.). What these findings reveal is that asynchronous learning was a convenient form for TPD due to teachers' very limited time availability but not very effective for teachers' collaboration which makes greater demands on teachers' time and schedule. Finally, supporting the study's proposition (see 4.7) the high-quality of EDIT curriculum, i.e. its content and material, played an important role to the functioning of the community as well by involving teachers' in meaningful intellectual engagement and, thus, balancing the gap of a developing sense of belonging and trust among its members.

In conclusion, the qualitative and quantitative findings reported indicate that EDIT succeeded in creating the processes and conditions that the study assumed to be essential for an effective differentiated teacher professional development program on differentiated instruction. What these findings revealed is that EDIT was a complex and challenging process which balanced among a wide array of contributing factors building on the Understanding by Design and the Learning by Design knowledge processes in the context of situated learning, i.e. a diversity-sensitive online asynchronous community of practice.

10.4. Teacher mindset change after EDIT

The 2nd research question of the study, 'how effective has EDIT been in transforming the 11 participant teachers' frames of reference' aimed to track teacher mindset change from the start of the program (see chapter 8). The findings of the descriptive statistical analysis (see 8.3.1.) and the qualitative and quantitative content analysis (see 8.3.2.) triangulated describing teacher *developing openness to diversity* after EDIT, (9 teachers, 82%) i.e. teacher perceptions, behavior and practices underlain by greater multiplicity, growth and internally focused assumptions (see 4.5.). In parallel,

the findings also described elements of teachers' remnant fixed mindset and stereotypical thinking. It is important to note that the participants were highly qualified experienced teachers with compatible humanistic teaching beliefs and a high interest in DI, so according to Parsons et al.'s (2018) research review (see 4.2) these variables contributed to their change and DI adaptability.

One of the two core emerging themes of the qualitative analysis (see 8.3.2) was teachers' raised awareness of student diversity, which indicates the transformative power of EDIT (see 7.4.1.). The statistical analysis (see 8.3.1) showed a key tendency of the participating teachers' change towards raised awareness of student diversity. Quantitative content analysis revealed that the number of meaning units, i.e. codes (16) devoted to descriptions of learner diversity by the vast majority of teachers (9 teachers, 82%) before EDIT increased after EDIT where all teachers (11 teachers, 100%) devoted a greater amount of meaning units (34) to descriptions of learner diversity. Teachers' responses (see 8.3.2) revealed greater attention paid to their learners and their needs at the end of EDIT (6 teachers, 55%) taking active steps to empower and encourage their learning. Moreover, the teachers after EDIT explained student differences exhibiting a more holistic understanding of learners making reference to inner psychological processes (7 teachers, 64%) and the teaching context (5 teachers, 46%). Teachers' reference to the teaching context indicates a developing situational thinking. According to Dweck (2012), people who hold a growth mindset about other people's traits tend to understand and interact better with diversity understanding others' behavior in terms of situations and psychological processes such as needs, beliefs, emotions, motives etc. These findings agree with Kumar and Hamer's (2012) research, which reveals close interactions and alignments between teachers' intercultural attitudes and growth mindset, both constituting the main components of openness to diversity, an overarching concept (see 2.8.).

Comparative analysis of teachers' answers (see 8.3.2.2) showed teacher change from fixed mindset-focused (9 teachers, 82% in 18 meaning units) before EDIT to more growth mindset-focused (9 teachers, 82% in 10 meaning units) teacher descriptions after EDIT. Such teacher mindset changes are due to the first two EDIT cycles, whose

focus was non-open to diversity communicative attitudes and behaviours such as teacher egocentric thinking and stereotypes in contrast to open communication, and growth versus fixed mindsets. Nevertheless, teachers' differential treatment of their students (see 8.3.2.2) persisted after EDIT where fewer teachers (3 teachers, 27%, in contrast to 6 teachers, 55% before EDIT) focused on advanced learners' learning revealing a persistent tendency to focus mainly on struggling students. Nevertheless, when they did refer to advanced student learning their rationales were more eloquent, long, writing about concrete learning processes and setting aims of autonomy-supportive learning, something that was not present in their rationales of struggling students' learning.

In accordance, the findings of teachers' self-reports (see 8.3.3) succinctly captured the following constituents of teachers' developing openness to diversity after EDIT with respect to learners:

a) teachers' widened perception of student diversity (6 teachers, 55% in the middle of EDIT, 5 teachers, 45% at the end of EDIT),

b) teachers' developing growth-mindset (7 teachers, 64%) becoming more patient towards students and believing in their potential to grow and developing growth-mindset about themselves and feeling more confident to have an impact on students (6 teachers, 55%),

c) the development of better teacher-student relationships (5 teachers, 45%), and

d) broader changes relating to their personal life and the way they communicate with
different others (3 teachers, 27%), which indicates important transfer of learning, i.e. openness to diversity, to other areas of teachers' life.

Overall, it was found that the participating teachers appeared more open to listen to their students' voice, to embrace them and openly communicate with them - not just 'teach' them – indicating a more dialogic teacher-student interaction (see 8.3.2). Teachers' self-reports (see 8.3.3) also drew a more succinct picture of what teacher

developing openness to diversity with respect to their teaching involved after EDIT, namely,

a) changes in teachers' perception of teaching (7 teachers, 64%),

b) development of teachers' deep understandings and becoming more knowledgeable (4 teachers, 36%),

c) changes in their classroom practices (10 teachers, 91%), such as designing for meaningful learning, becoming more autonomy supportive through the provision of multimodal and other choices together with the cultivation of a growth mindset culture, experimenting with new practice

The results of the descriptive statistical analysis (8.3.1) showed considerable teacher change towards more growth mindset assumptions concerning both their students, i.e., their belief in student ability to change and learn, and themselves, i.e. their belief in their own ability to positively contribute to student learning. For example, the central teacher tendency mean=3.36 before EDIT has changed to mean=4.27 after EDIT with respect to a central DI teacher belief in all students' potential to be successful.

The second core emerging theme of qualitative analysis (see 8.3.2) was teachers' assuming more responsibility for their learners' learning even for struggling students' learning as their confidence grew. This agrees with the study proposition that teaching teachers about the growth mindset and allowing them to reflect on it, would have an impact on their own mindset and resilience in face of difficulties. In agreement, Blackwell et al's (2007) research claims that teaching a growth mindset to students has been shown to result in a significant boost in students' motivation and achievement especially during challenging academic transitions. Overall, after EDIT teachers' responses revealed a changed perception of teaching as a process. The majority (8 teachers, 73%) of teachers' answers were underlain by deeper and more conscious differentiated teaching assumptions referring to some concrete learning conditions and processes. By the end of the 4th EDIT cycle almost half of teachers (6 teachers, 55%) perceived differentiation as instruction offering opportunities for effective learning and learner growth underlying a shift of focus from the image of

'teacher teaching' at the beginning of the program to that of 'learners learning' at its end. In agreement, the findings of the statistical analysis (see 8.3.1) showed that teachers developed deeper understanding of meaningful learning principles regarding the importance of connecting prior to new knowledge(from mean=3.91 before EDIT to mean=4.45 after EDIT) and the importance of restructuring meaning in a range of modalities (from mean=4.30 before EDIT to 4.45 after EDIT). Such teacher mindset changes and learning is possibly greatly due to the last two Learning by Design cycles, whose focus was on differentiated high-quality curriculum design, and their own learning experience with such a curriculum in EDIT. This combination of changed perceptions and deep understandings transferred in their teaching practice. The teachers (see 8.3.2) reported the following changes:

a) provision of variety to learners such as using multimodality, offering choices, using a variety of material by making an explicit reference of their connection to learner needs (8 teachers, 73%),

b) consciously thinking and planning learning (7 teachers, 64%),

c) differentiating content (3 teachers, 27%),

d) creating the appropriate affective conditions (2 teachers, 19%),

e) grouping learners (2 teachers, 19%),

f) using formative assessment (1 teacher, 10%) and

g) being open to lesson adaptation (1 teacher, 10%).

What the findings of this section indicate is an interconnection between teachers' developing perception of their learners and their own developing teaching practices. These two appear to be connected as the cycles of participation progressed. Teachers' raised awareness of diversity seems to be somehow connected with teachers assuming more responsibility of their learners' learning. And most importantly, there also seems to be a connection between teachers' developing growth mindset about their students' potential to learn with their developing growth mindset about their own potential to succeed, which directly affects their teaching motivational behavior. Chapter 2 has already discussed Haimovitz and Dweck's (2017) research that shows that growth mindset teachers with respect to their own traits tend to seek challenging

opportunities for learning and employ teaching practices that focus on process and learning. According to Tomlinson and Imbeau (2014), teachers with growth mindset beliefs aim high by creating intellectually rigorous curriculums and, then, build scaffolding for their students to help all of them unfold their hidden potential and reach those high aims (see 2.8.2). At the same time, Dweck's (2012) research shows that the development of people's growth mindset interrelates with their understanding and better interaction with diversity underlying growth-mindset's inherent relationship with openness to diversity.

10.5. Development of teacher ability to design high quality differentiated learning elements after EDIT

The 3rd research question asking 'what effect has EDIT had on teachers' ability to design high quality differentiated learning elements?' aimed at tracking any teacher change and development in their ability to design high quality differentiated learning elements after the EDIT intervention taking into account the scheme of predetermined criteria developed for the qualitative content analysis of the learning elements (see 6.7.4). It is important to note that teachers' learning elements before and after EDIT were of different duration. The before EDIT learning elements were one-hour learning elements while the after EDIT learning elements were commonly designed for a longer teaching time period. What is more, EDIT did not include any directions on how teachers could handle language learning aims and/or objectives in connection to the Integrated Foreign Languages Curriculum when using the Understanding by Design model. As a result, before EDIT teachers set more linguistically oriented aims and objectives focusing on language skill development, while after EDIT their aims and objectives focused more on learners' understanding of a wide range of knowledge such as the arts, immigration, the environment, healthy food habits, hate crimes, etc.

The findings revealed that the contribution of the Understanding by Design and the Learning by Design fusion as a tool/model for helping teachers design semi- or high-quality differentiated learning elements after EDIT has been decisive (see chapter 9).

It is indicative that after EDIT all teachers' (8 teachers, 100%) learning elements were more meaningful building on student semi- or high-quality understanding and employing a variety of learning styles, while the great majority of teachers' (7 teachers, 87,5%) learning elements were more relevant to the learners and differentiated along multiple modalities. In parallel, the majority of teachers' learning elements (6 teachers, 75%) involved learners in learning with others, which suggests their developing openness to diversity, a construct that inherently connects to more open interaction with others. What is more, it mirrors their own experience of open interaction with others and openness to diversity within EDIT, which the analysis of their experience with EDIT revealed that had a great impact on them. Finally, more than half of teachers (5 teachers, 62,5%) managed to design more coherent learning elements supportive of learners' autonomy. What these findings indicate is that in contrast to designing a meaningful learning element making it also coherent throughout its various elements is demanding requiring greater teacher familiarization and experience in designing learning elements while taking into account many different variables. On the other hand, the fact that after EDIT more than half of teachers (5 teachers, 62,5%) designed learning elements which were supportive of learner autonomy indicate teacher growth from the beginning of the program, where the use of practices supportive of student autonomy such as offering choices taking into account learners' different learning preferences and interests was among the least frequent (see 7.2.1).

The findings also indicated that teacher change was gradual and took time building on teachers' prior knowledge. In this study, the teachers' growth moved successively from low to semi to high-intellectual quality indicators. This finding adds to the research validity of this study since it agrees with a core meaningful learning principle saying that new knowledge builds on prior knowledge. In the same line, the analysis revealed that teachers were more apt in the implementation of the Learning by Design processes that the traditional school uses more often and with which they were already more familiar such as the processes of Conceptualising, Experiencing the New and Analysing. In contrast, the participants had greater difficulties and needed more time to understand the nature of and effectively implement the Learning by Design

processes of Experiencing the Known and Applying Creatively, two knowledge processes that connect learning with the learners' lifeworld and which can employ more open and creative tasks for learners.

Finally, in terms of EDIT's effectiveness in relation to helping in particular EFL teachers design subject-specific learning elements, it is important to note that despite the absence of explicit EFL aims and objectives, the after EDIT learning elements were in alignment with the Integrated Curriculum for Foreign Languages (IC-FL) (Paidagogiko Institouto, 2012), which aims to support the development of citizens who will be able:

a) to perform effectively in diverse social contexts, situations and communication situations,

b) to act as intercultural and interlingual mediators among individuals of different social and cultural groups,

c) to take initiatives using the language they are learning following their interests and participating in events and projects of the international community,

d) to negotiate effectively new and old linguistic, social and cultural concepts,

e) to use their knowledge, experiences and strategies in order to communicate with others showing respect to their difference, or in order to solve problems.

Other than that, teachers' after EDIT learning elements involved learners in rich and meaningful foreign language learning experiences. In particular, the learning elements that the teachers designed after EDIT involved learners in a) more meaningful and relevant learning using English as a medium, and b) English as a Foreign Language learning through a wide variety of modes using multiple sources, a wide variety of reading texts and videos and drawing that way richer connections to the foreign language. As a result, learners used language for genuine communication purposes producing rich output of written and spoken English within a context of rich foreign language input.

10.6.   Implications

This study has important implications at a theoretical, research, practical and policy level. Firstly, in the context of this research, drawing on the study's review of literature research, there has been developed an original synthesis of an integrated and comprehensive model about the nature of DI, which makes explicit the DI underlying processes drawing clear connections between *who* we teach and *how* we teach at both the affective and planning level. This theoretical reframing of DI makes an important contribution to current research on DI (e.g. Bondie et al , 2019; M van Geel et al, 2019), where a gap is identified at theory of DI where definitions give a vague view of how it can be implemented in the classroom (Bondie et al, 2019). In addition and towards this direction the study goes one step further to propose the combination of two curriculum design models, Understanding by Design (Grant Wiggins and Jay McTighe, 2005) and Learning by Design (Kalantzis and Cope, 2004) as useful practice-focused tools for helping teachers design high-quality differentiated learning elements. That way, explicit connections are drawn between the theoretical principles of effective differentiation and teacher practice. The results of this research complement research such as Van Harren (2015), which found that LbD succeeds in engaging learner diversity, intrinsically motivating learners and ensuring intellectual quality and equivalent outcomes for all despite their different starting points. In the current PhD research, the combination of Understanding by Design (Grant Wiggins and Jay McTighe (2005) and the Learning by Design curriculum design template (Kalantzis and Cope, 2004) played a significantly contributing role for both teachers and the teacher educator in succeeding to build high-quality meaningful and differentiated curriculums. Such findings have important implications for both teacher and teacher educator practice.

In parallel, the study makes important and original contributions in the field of teacher professional development on differentiated instruction where research is poor with no data that actually indicate the precise formula that teacher professional development programs on DI should follow (Dixon et al 2014). At the level of theory and in relation to what to teach in such a professional development program, this PhD

study has identified specific teacher competences that are necessary to develop for a teacher to be able to differentiate effectively in accordance to the identified need to shift the focus from surface DI strategies to understanding the underlying processes of effective differentiation, the acting and reasoning of teachers (Bondie et al, 2019; M van Geel, et al, 2019). These core teacher competences are:

     i.   openness to diversity

     ii.   the ability to design high-quality differentiated learning elements.

At the level of practice, the identification of these DI teacher essential competences can help teacher educators identify teacher professional development aims and objectives focusing their programs on essential knowledge about differentiation. The results of this PhD research supported this proposition showing that teachers found the EDIT content, which was in alignment with the specific teacher competences, as highly relevant to their professional needs. In addition, in agreement with Coubergs et al (2017) research, which found that teachers' growth mindset perceptions positively predict their ability to differentiate, the results of this research support the need for developing teachers' openness to diversity as part of their professional development on DI. The findings of this study have revealed an alignment between the before EDIT mainly fixed mindset teacher perceptions and their linear transmissive teaching differentiated practices before EDIT, while their after EDIT more growth-mindset perceptions of both their students and themselves aligned with their developing ability to differentiate effectively after EDIT. The findings of this study have shown that transformation of teacher mindsets by raising teacher awareness of student diversity, developing their knowledge and understanding of different student needs as well as their deep knowledge and understanding of how to design on their own high-quality differentiated learning elements have positively contributed to their developing openness to diversity after EDIT along with their assuming more responsibility of their learners' learning after EDIT. These findings build on research (Parsons et al., 2018; Smets and Stuyven, 2020; Bondie et al., 2019; Coubergs et al., 2017; van Geel et al., 2019; Strogilos, 2018), which identifies as important facilitating or hindering variables of a teachers' ability to differentiate effectively teacher beliefs

about student diversity together with teacher knowledge about students and subject-matter, and teacher control over their teaching.

But apart from *what* to teach to a TPD program on DI, this PhD study makes important theoretical, research, practice and policy level contributions with respect to *how* to teach by proposing the use of an original synthesis of a polyvocal transformative approach within the context of an open to diversity online asynchronous community of practice. Thus, this study is situated within current research acknowledging the inherent complexity of teaching and teacher education, and the very many variables involved (Darling-Hammond, et al's, 2017; Desimone, 2009). And, whilst the field is still struggling to conceptualize holistically effective teacher professional development for quality education and teacher professionalization (e.g. Hargreaves, 2016), the use of a polyvocal transformative approach for teacher professional development could be the new theory that the field is lacking to make any progress (Thurlings and den Brok, 2017). What is more, within the context of the study an actual polyvocal transformative teacher professional development program on DI, EDIT, was designed and implemented, while the analysis results indicated its multifaceted effectiveness in

a) changing the participant teacher mindsets' towards developing openness to diversity,
b) learning to design semi or high quality differentiated learning elements and
c) intrinsically motivating, i.e. addressing all the participant teachers' affective needs throughout what they characterized a demanding program voluntarily staying to its end despite their heavy schedules.

Subban (2006) research claims that the results of a program on differentiation can only be seen over a few years, with the initial stages being used to overcome teacher resistance and encourage their sustained effort. Accordingly, by the end of EDIT, the majority of teachers claimed that they needed more practice with DI to feel adequately trained to follow differentiation principles in their classroom. Nevertheless, the findings of teacher developing openness to diversity and their

developing ability to design high-quality differentiated learning elements by the end of a yearlong program reveal important teacher change and learning for teachers, who were interested in DI before the program.

The qualitative and quantitative findings of this study indicated that EDIT succeeded in creating the necessary transformative, differentiated and situated learning processes and conditions in an online environment for these results to occur with important implications in terms of research, policymaking, teacher and teacher education practice. Teachers' accounts of their experience with EDIT revealed the following *transformative learning processes* that the program employed:

a) teachers experienced the new paradigm of differentiated instruction, 'an innovative experience unlike anything else and away from the mainstream'

b) teachers practiced the new paradigm of differentiated instruction in their own classrooms with their students reporting on successful DI implementation experiences

c) teachers were involved in constant reflection of self, their teaching practice, teaching and learning stereotypes, their relation with their students

d) they engaged vicariously in rational discourse with others within the community silently reading others alternative perspectives, which contributed to opening up their egocentric thinking

e) they interacted with the teacher educator, who was seen as a provider of intellectual and scholarly leadership

Teachers' accounts of their experience with EDIT revealed also the following *differentiated learning processes* and *conditions* that the program created:

a) teachers experienced a thoroughly planned meaningful curriculum involving them in active meaning making focusing on understanding DI and drawing multiple connections among core concepts. It is indicative that the EDIT tasks were described as well-organised, structured, cohesive and meaningful.

b) teachers experienced polyvocal learning pathways, through the Learning by Design polyvocal knowledge processes of experiencing, reflecting, thinking and acting along with multimodal meaning representations. It is indicative that the participants commented on the quality, the multimodality, the wealth and range of the material placing special emphasis on the Ted talks they watched.

c) teachers experienced a feeling of inherent enjoyment and intrinsic motivation during their involvement with the program due to its challenging tasks and content, its utility in helping teachers achieve effective teaching in practice and address student needs, its welcoming and integrating teacher life-worlds of everyday practice into their learning, its strong reflective nature, and the affective role of the community (see b. in online community of practice learning processes right below).

Teachers' accounts of their experience with EDIT revealed also the following *online community of practice learning processes* and *conditions* that the program created:

a) intellectual sharing and mutual learning processes, i.e. exchanging ideas, opinions, resources resulting in enriched thinking, understanding and teaching practice

b) affective processes, i.e. others' comments arousing teacher interest, feeling connected through personal sharing of experiences, anxieties and problems and developing a gradual sense of belonging in the course of the program

c) interaction was reported as a valuable aspect of the program. EDIT interaction took mainly the form of sharing monologues in the context of responding to weekly tasks. Review of studies (Lantz-Anderson et al., 2018) about formally-organized communities support this finding since teachers in such communities seldom challenge their peers in discussions, seldom engage in higher levels of analysis and reflection, address the content of the course or further the discussion. EDIT teachers claimed that they needed more face-to-face interaction since they did not know each other and that variable hindered

their participation in the community. On the other hand, teacher reference to the content and material of EDIT

as facilitating their community participation implies that the polyvocal transformative nature of the curriculum managed to involve teachers in meaningful intellectual engagement balancing the gap of trust among its members. On the other hand, adding elements of online and/or face-to-face synchronous communication would be facilitating both to teachers' better collaboration, direct interaction and their quicker development of trust within the community.

d) asynchronous learning was convenient due to very limited teacher time availability but not very effective for teacher coordination in collaborative tasks.

Overall, the research findings underlie the need for polyvocal transformative learning in teacher professional development for DI in accordance to the relevant literature like Webster-Wright's (2009) that focuses the problem of the teacher resistance to change into a learner-centered education to the implicit predominant 'training' model assumptions about professional learning, where learning equals knowledge transmission in univocal learning pathways allowing for no critical examination and critique. These findings have important implications for the Greek context as well where teacher training offered to teachers by school advisors constitutes two-hours meetings which are informative in nature and involve simple presentations by invited guests on specialized topics (Georgiadou, 2011).

10.7. Suggestions on building a polyvocal transformative teacher professional development program.

According to this research study's results, polyvocal transformative teacher professional development involves four core aspects:

a. **The affective aspect**: creating the appropriate affective conditions for the development of teachers' intrinsic motivation, i.e. the satisfaction of their basic affective needs for competence, autonomy, a sense of belonging (Krapp, 1999; 2005).

b. **The social learning aspect**: building an online community of practice where teachers develop feelings of a sense of belonging while learning with others (Wenger et al, 2011).

c. **The self- reflective aspect**: raising teacher awareness over two core aspects of openness to diversity, i.e. stereotypical and egocentric thinking versus reflective engagement with different others, fixed versus growth mindset (Mezirow, 1996, 1997; Cranton, 1996; Epley, 2014; Kumar and Hamer, 2012; Dweck, 1999, 2012)

d. **The meaningful learning responsive to teacher diversity aspect:** designing learning elements that follow meaningful learning principles that build deep understanding of the subject matter so that knowledge becomes usable and transferable to real classrooms while employing a variety of diverse learning pathways (Kalantzis and Cope, 2016; Wiggins and McTighe, 2005; Gibbons, 2008; Ausubel, 2000; Gagne et al, 1993; Bloom, 1956; Tomlinson, 2001; Kolb & Kolb, 2009; Gardner, 2000; Reeve, 2009).

In the sections, 10.7.1. and 10.7.2, there follow some practice-focused suggestions on how a teacher educator could build a professional development program grounded on a community of practice and creating the conditions for meaningful learning that is responsive to diversity, to teachers' affective needs and the need for teacher self-reflection.

10.7.1. Suggestions on building effective communities of practices.

Suggested steps for developing a robust **community of practice** are the following:

a) **The first face to face community meeting:** the first meeting sets the pace for the community's trajectory. It aims to introduce the teacher educator and the community members to each other, and to the community culture of openness in communication and to diversity. It is important that teacher educators introduce themselves authentically as persons and professionals with certain qualities so as to establish an open communication with the community. For example, teacher educators can communicate their own vision of an inclusive education and how this has motivated and informed their own educational and professional history. It is also important to state explicitly the purpose of the community, the teacher educator's role as a collaborative learner, the members' role within the community, the role of relationships and open communication, the role of both positive and vulnerable feelings, the importance of taking risks in the classroom with DI and feeling safe within

the community. During this meeting, it is important to give the participant teachers the opportunity for free interaction to get to know each other better.

b) **Community building:** for community building offer opportunities for teachers to engage with each other in intellectual and affective work such as exchanging ideas to open-ended questions, to the co-creation of papers, to co-designing learning elements, sharing resources and classroom experimentations, giving and taking feedback, sharing positive and vulnerable feelings, sharing experiences, giving and taking emotional support and feeling connected through personal sharing. The aims a teacher educator should set for teachers in order to develop a community of practice with an open to diversity culture are a) being open to alternative perspectives, b) reflecting and feeling free to choose their own pathway, c) everyone having an equal opportunity to participate, d) negotiating together new knowledge, e) experiencing emotional support during experimentation with the new, f) sharing of resources, material and knowledge, and g) the teacher educator as a collaborative learner.

c) **Follow-up face to face meetings:** the face-to-face community meetings aim to give teachers opportunities to interact in person in a synchronous manner. It is important to leave enough space for free discussion with teachers on topics of their own choice or facilitate the discussion with prompt questions so as to give the chance to teachers to express both positive and vulnerable feelings felt during the online program, ask clarifying questions, negotiate and solve possible issues brought up during online learning and distance communication, set future aims for community work.

It would be optimum to blend online asynchronous with synchronous and face to face community learning and meetings. For online learning, choose a platform with visually appealing and accessible interface which allows a) creating posts embedded with videos, links and photos, b) commenting below community posts, c) co-creating documents and making peer reviews, d) easy access to previous archives and posts, e) interactivity features such as emojis that would help build more unobtrusively their conversations, content sharing and relationships.

Finally, it is important that the teacher educator does not feel threatened by teachers'

experienced difficulties, possible negative feelings expressed. The teacher educator should bear in mind that it is natural for teachers to feel vulnerable while taking risks outside their safety zone, or experience difficulties in communication with others. It is important that the teacher educator creates a safe place for those feeling and difficulties to be communicated, listened to by others, acknowledged as legitimate and where necessary take active steps to adjust future ways of communication, work or learning according to teacher needs.

10.7.2. Suggestions on effectively differentiating teacher professional development programs.

a. For the creation of the appropriate affective conditions, the suggested steps are the following:

- o satisfy the competence need by **setting challenging tasks** so that teachers experience feelings of efficacy from having exercised their existing capacities (Pintrich & Schunk, 1996) and by **cultivating a growth-mindset climate** so that teachers believe that their own teaching ability can develop and sustain the challenges of differentiation, i.e. in face of difficulties interpret failures and mistakes as an inherent part of the learning process – not reason for self-accusation (Dweck, 1999; 2012).
- o satisfy the autonomy need by allowing teachers to experience feelings of being independent from undesired pressure. Following Reeve's (2009) **autonomy supportive teaching style:** a) welcome teacher thoughts, feelings and actions, b) take and integrate teachers' perspectives into the flow of instruction, c) recommend constructive ways of thinking and explanatory rationales, d) nurture teachers' inner motivational resources such as interests, preferences and psychological needs, e) display patience to allow time for self-paced learning, and f) allow them to **critically reflect** on self and society by enabling them to make conscious choices and assume responsibility in shaping the course of their own teaching facilitating that way their growth and empowerment (Kumar, et al. 2018).
- o satisfy the relatedness need by creating the conditions for teachers to experience a sense of belonging to the community, i.e. **feel connected and accepted** by the other teachers in the community (Krapp, 2005). (see Community building below)

b. For raising teacher educators' own and their teachers' openness to diversity, the suggested steps are the following:

○ awareness raising about different perspectives, stereotypes and the value of reflective engagement with others grounded on beliefs of equality of all people and beliefs of respect for diversity.

What do teacher educators do?

It is important for teacher educators who wish to differentiate to be aware of their own stereotypical or prejudiced biases so as to avoid teacher and student stereotyping due to perceptions of others through a single identity or characteristic. The differentiating teacher educator perceives others as **individuals with multiple qualities** and identities to be discovered.

What do teachers do?

Teachers listen to different **perspectives** and experiences, they have an equal opportunity to participate, they reflect and hear others free from coercion and feeling free to choose their own pathway, negotiate together new knowledge, they experience the teacher educator as a collaborative learner, they experience emotional support within a community and sharing of resources. This experience contributes to teachers raised awareness of the existence of different perspectives, the value of reflective engagement and openness to diversity as well as the value of an open to diversity community.

○ awareness raising about all students' - advanced and struggling - potential for growth and change grounded on growth mindset beliefs, i.e. beliefs that learning experiences result in the creation or expansion of neuronal connections in the brain

What do teacher educators do?

The differentiating teacher educators are teachers who are deeply knowledgeable professionals **willing to create,** to innovate, to change. In parallel, they bear in mind that differentiated aims inherently involve the person in a process of having to deal with **possible failures, or difficulties**, and feelings of shame within a highly evaluative environment such as that of a teacher professional development

community, or culture – the Western culture - that is highly obsessed with perfection and looking 'smart'.

What do teachers do?

By differentiating instruction teacher educators aim to facilitate all teachers **reach their full potential** and feel motivated by an **inherent desire to learn** and master new skills - to grow. When differentiating, teacher educators want all teachers to feel motivated in learning and not easily give up in the face of difficulties, or even failure.

It is important for teacher educators to make teachers aware of **how individuals learn** and how **different learning experiences** result in the creation or expansion of neuronal connections in the brain through a process of having to deal with possible failures, difficulties, and feelings of shame.

c. **For identifying *what* to teach** for meaningful learning that is responsive to diversity, the suggested steps are the following:

Think well and be clear on what teachers are expected to do and know by the end of each learning element.

What do teacher educators do?

1st step: identify the *essential knowledge,* or else the 'big ideas', i.e. the crucial and critical concepts of the content area (Wiggins & McTighe, 2005)

2nd step: turn the lesson's essential knowledge in the form of one or two **essential questions** (Wiggins & McTighe, 2005)

3rd step: Identify the desired results of learning, i.e. set the objectives of teaching and learning centering around the lesson's essential knowledge and questions

4th step: **plan for understanding** through the use of a variety of **higher-order thinking processes** (e.g. understanding, application, analysis, creation in Bloom's (1956) taxonomy, or the Learning by Design knowledge processes (Kalantzis & Cope, 2004)

Suggested tool: Understanding by Design (Wiggins & McTighe, 2005)

What are some core concepts and essential questions to pose when teaching for Differentiated Instruction?

1st cycle core concepts: stereotypes, egocentric thinking, reflective engagement

1st cycle essential question: What are the mistakes that prevent us from effectively understanding learners?

2nd cycle core concepts: fixed mindset, growth mindset

2nd cycle essential question: What makes some learners persist in face of difficulties or failure?

3rd cycle concepts: meaningful learning, essential knowledge, higher-order thinking

3rd cycle essential question: What makes a high-quality curriculum?

4th cycle concepts: the Learning by Design knowledge processes, multiple intelligences

4th cycle essential question: How can we teach to students' different learning styles?

The type of knowledge that meaningful learning uses is conceptual knowledge which consists of categories and classifications, principles and theories that show how the different bits of information are **interconnected** and **interrelated** (Anderson et al, 2001).

d. **For creating the appropriate conditions for meaningful learning that is responsive to diversity**, the suggested steps are the following:

For designing for meaningful learning:
- Make lessons relevant to teachers, i.e. welcome teacher lifeworld into their learning (Kalantzis & Cope, 2016).

  Suggested steps:
  - design **open-ended tasks** allowing teachers to offer their own perspective and answer creatively (Reeve, 2009).
  - start by connecting teacher lifeworld (i.e. prior teacher experience, interests) with new learning, i.e. the lesson's essential knowledge (Ausubel, 2000; Gagne et al, 1993; Getha-Eby, 2014).

- transfer learning to teachers' real classrooms and novel situations (Wiggins & McTighe, 2005)

o Build on teacher understanding of the lesson's essential knowledge necessitating conceptual and higher-order thinking drawing interconnections among the various concepts.

Suggested steps:

- **Understanding** (Bloom, 1956), or else Conceptualizing by Naming and by Theory (Kalantzis & Cope, 2004), i.e. organize concepts into coherent interpretative systems (e.g. explaining, questioning, comparing, contrasting, classifying)

- **Applying** (Bloom, 1956; Kalantzis & Cope, 2004), i.e. transferring theory into practice (e.g. using, writing, illustrating, solving)

- **Analysing** (Bloom, 1956), or else analyzing functionally (Kalantzis & Cope, 2004), i.e. distinguishing between the different parts (e.g. criticizing, differentiating, testing, examining, figuring out cause-effect)

- **Evaluating** (Bloom, 1956), or else analyzing critically (Kalantzis & Cope, 2004), i.e. justify a stand or decision (e.g. arguing, supporting, judging, interrogate interests / motives, ethics, etc)

- **Creating** (Bloom, 1956), or else applying creatively (Kalantzis & Cope, 2004), i.e. imagining new perspectives; mixing and matching the familiar into unusual, original ways (e.g. designing, producing, formulating, making)

The main aim is all learners to reach deep understanding of the subject matter so that knowledge becomes usable and transferable to real-world contexts.

For responding to teacher diversity provide a variety of learning pathways.

Suggested steps:

- involve teachers in various learning styles such as experiencing, reflecting, thinking, and acting (Kolb & Kolb, 2009; Tomlinson, 2001). It is important to note that **the process of experiencing is inhibited by the thinking mode** because it focuses the learner's attention too much on their **thoughts** and, thus, it distracts attention from the **feelings** and sensations experienced at the present moment.

- support learners' understanding of the topic by drawing multiple connections to the topic (Kalantzis and Cope, 2004; Gardner, 2000; Tomlinson, 2001)

.

    i. *Connections to oneself (reflection)*

    ii. *Connections to others (interaction & dialogue with others)*

    iii. *Visual-spatial connections*

    iv. *Musical-rhythmic connections*

    v. *Verbal-linguistic connections (English & Greek language)*

    vi. *Logical-quantitative connections*

    vii. *Naturalistic connections*

    viii. *Bodily-kinesthetic connections*

This multiple intelligence and learning styles perspective to understanding appears actually compatible with the cognitive psychology principles of meaningful learning, where the more connections and associations individuals make to a concept, the more sophisticated understanding they reach.

- foster teacher autonomy by providing options welcoming teacher thoughts, feelings, actions (Reeve, 2009), by including teacher interests (Tomlinson, 2001), by offering self-reflection opportunities (Cranton, 1996)
- foster learning with others by providing opportunities to share experiences, feelings, perspectives (Kalantzis and Cope, 2012), collaborate and negotiate perspectives with others (Mezirow, 1997), work in pairs and groups (Tomlinson, 2001)

A suggested tool for creating the appropriate conditions for meaningful learning that is responsive to diversity is Learning by Design (Kalantzis & Cope, 2004).

10.8. Limitations of the study

The present research was carried out under certain limitations. Firstly, both quantitative and qualitative findings were based on a relatively small number of participants, i.e. 11 Greek EFL teachers. The analysis hence provides rich descriptions of each participant's experiences and the findings are interpreted in close relation to their context and the participants' profile. Secondly, the findings of the learning element analysis (see chapter 9) were based on a sample of even fewer teachers, that

is, 8 teachers, as it has already been mentioned in the relevant chapter (see chapter 9). Three teachers' learning elements were not included because they only submitted one learning element either before or after EDIT due to their work overload at the time so no comparison was possible for tracking change. Nonetheless these artifacts provide evidence of shifts in mindset and teaching/learning practices. Thirdly, EDIT did not draw any connections to how teachers could handle foreign language learning aims and/or objectives in connection to the Integrated Foreign Languages Curriculum. Consequently, the choices made by the participating teachers in their learning elements indicate their own progress in understanding. After EDIT their aims and objectives focused solely on learners' understanding. Fourthly, as it was mentioned in chapter 5, the initial EDIT planning included three more LbD cycles on the following topics a) learner diversity by interest and common basic needs, b) learner diversity by multiple intelligences and multiliteracies, and c) learner diversity by learning styles and experiential learning, with the intention to develop teachers' deeper differentiated instruction understanding. However, the program had to be condensed due to the time each Learning by Design cycle demanded for its completion in relation to the participating teachers' workload and time constraints. Finally, while teachers implemented their differentiated learning elements and got feedback from their students, which they shared with the community, it was out of this research scope to analyze and present these data.

10.9. Proposals of EDIT changes after its implementation

After EDIT implementation in the context of this study and the feedback received from the participant teachers, the following changes are seen as appropriate for further enhancing the program's effectiveness:

a) more frequent face-to-face meetings. This need was quite vividly expressed by the participants either informally in our personal communications, or more formally in their responses to the questionnaires. They needed to see each other's faces, hear their voices, discuss more directly and feel connected in real time. The first and the second face-to-face meetings were fundamental in that respect, i.e.

building and sustaining a feeling of connection among teachers, and leaving them longing for an even deeper and more frequent such immediate sense of connection. The online aspect of the community somehow hindered the development of a deeper sense of belonging and trust to the community shown in the late development of such feelings and teachers' not feeling safe enough to spontaneously comment on each other's posts.

b) some awareness raising exercises, or the provision of incentives for teachers to comment on each other's posts would have possibly been more efficient in fulfilling the observed gap of online interaction among EDIT participants, which annoyed some of the teachers expecting their colleagues' greater level of responsiveness. The teacher educator had made a conscious decision before the start of the program to try not to be overly controlling in the way the EDIT relationships developed, leaving enough space for teachers to take their own initiatives and often inviting them to do so. Possibly, this was not the wisest choice and teachers' needed more scaffolding to the development of open communication with their colleagues apart from their students. After all, open communication is the result of an open to diversity mindset and the analysis results have revealed that the participant teachers at the beginning of the program did not openly communicate with diversity.

c) use another platform as a medium. The Scholar platform, a community based platform, did provide lots of features and functionalities like making peer reviews, creating documents embedded with videos, links and photos, commenting below community posts, messaging community members in a private Scholar space, etc. Nevertheless, in the era of social media and technology advancement, teachers were accustomed to simpler and more friendly-user interfaces, more visually appealing and accessible designs, and interactivity features that would help build more unobtrusively their conversations, content sharing and relationships. For example, the existence of a feature such as emojis, would have been an easy, quick and affective way to respond to each other's posts making up for the absence of written responses, which usually require more time and thinking.

Another important feature, would be a functionality allowing teachers to respond in previous comments creating a coherent string of comments building on a particular conversation. Instead, Scholar allowed only linear comments, one below the other. As a result, teachers were instructed to begin their comments with @ and the name of the colleague, to whose comment they were responding so as to somehow keep the flow of the conversation. It is also important to note that teachers had to switch to Google Docs in order to work together on a community document about the Protocol of a Growth Mindset Classroom because they found it easier and more user-friendly for group work.

d) the inclusion of more subject-specific content, i.e., the use of EFL aims and objectives in connection to the Integrated Foreign Languages Curriculum in teaching teachers' design high-quality differentiated learning elements. EDIT focused solely on developing teachers' understanding of the importance of setting understanding aims and employing higher-order knowledge processes for meaningful learning. In other words, it focused on the fundamentals of high-quality differentiated learning elements of any school subject leaving unanswered some more TEFL specific issues. Shulman (1986) emphasized enough the importance of including subject matter knowledge for effective teacher learning.

e) revised Learning by Design conceptualization and analysis tasks in the four EDIT Learning by Design cycles so as to shorten where *possible* and *necessary* these sections of the program. EDIT is a long program and some teachers' found its 'theory' too much. Nevertheless, setting essential understanding aims and involving the participants in higher-order thinking processes is part of the program's fundamental principles – and success - for effective learning and teachers' feeling challenged. So, there must be kept the right balance between understanding processes, on which latter transfer in practice and teacher change build, and teacher practice through the design and implementation of differentiated learning elements in their classrooms with their students.

f) more accurate estimation of the program's duration and content taking into account teachers' already heavy workload and important school periods such as mid-term and final exams. It has already been discusses (see 5.6.) that EDIT initial planning involved seven cycles and was estimated to end by May 2017. Nevertheless, a combination of its demanding nature and teachers' heavy schedules led to a rescheduling of both EDIT content, i.e. four Learning by Design cycles, and duration, i.e. by November 2017. As a result, teachers and the teacher educator by the end of the 2016-2017 school year were exhausted after a long demanding program, which overlapped with the school year's final exams, which makes different demands on teachers than the rest of the school periods. In reality, EDIT could be planned to last for two or one and a half school years so as to allow teachers for a longer Applying Creatively cycle, where they would be able to design and implement more learning elements and, then, come back to the community and share their experiences with others, or answer more questions about DI in practice.

10.10. Suggestions for future research

Teacher professional development on differentiated instruction is a new research area so EDIT research could be repeated a) with a similarly small number of participants, b) a larger number of participants within an online asynchronous community of practice, c) small or large number of participants in various communities of practice configurations such as face to face, online asynchronous, and online synchronous, or different participant characteristics such as teachers with moderate qualifications, less experienced, less interested in DI, from various areas in Greece or abroad, or different teacher educators' characteristics such as not having designed the program themselves. What is more, it would also be interesting to carry out a research on a differentiated TPD program on DI trying to cultivate an open to diversity community of practice within the bounds of one school, and/or comparatively among more schools so as to explore the role of the school context. A study could also be carried out on a program involving Learning by Design cycles on the topics that EDIT had to leave out such as learners' basic affective needs and explore effect on its participants. Alternatively, studies could be carried out on short-duration programs involving only

one or two of the Learning by Design cycles since each cycle can also function autonomously and stand on its own. Finally, a self-reflexive study on the teacher educators' experience of implementing DI within the context of a TPD on DI would give useful feedback for future research.

10.11. Conclusion

The current research has explored the answer to the question of what makes effective TPD on DI. It developed an original framework on the nature of DI which set the ground for the study's second major contribution, the proposal of transformative and differentiated teacher professional development on DI in the context of a community of practice using the Learning by Design knowledge processes. The third contribution of the study concerns the design and the implementation of EDIT, a differentiated TPD program on DI, in the context of an online asynchronous community of practice of 11 Greek secondary school EFL teachers. The findings indicated the program's success in creating the necessary transformative, meaningful learning and intrinsically motivating processes and conditions resulting in the participant teachers' developing openness to diversity, the development of their ability to design differentiated semi- and high-quality learning elements while addressing their basic affective needs for competence, autonomy and relatedness.

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