

Differentiation of Teaching and Learning: Difficulties and Misconceptions

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Abstract

This article investigates teachers' misconceptions (National Research Council, 1997) about differentiation of teaching and learning which affect teachers' attitudes towards theory and the implementation of differentiation in classrooms of mixed readiness. The aim of the article is to answer the question usually addressed by teachers in all levels of education referring to the difficulty to teach simultaneously students with different academic needs and to fulfil their different expectations. The question as such reveals implicit theories and misconceptions pertaining to teachers' understanding of differentiated instruction. Clarification of the concept and provisions for the participatory in-service teachers' training through Action Research (e.g. Koutselini, 2008b; 2010) are provided.

Keywords: differentiation, misconceptions, action research, constructivism, cooperative learning.

Introduction

Although there is a rigorous and comprehensive literature review on the differentiation of teaching and learning, the expected results which have accrued from research have not been translated into teaching practice. As a general rule, teaching at all levels of education remains teacher-centered, with the dominant mode of undifferentiated instruction failing to account for students' diverse needs and abilities.

The rapid changes in various societies and educational systems due to the continued influx of immigrants into schools, the commitment to reduce school dropouts and illiteracy, the policy of integrating children with disabilities and/or learning disabilities into the classroom, and the need to empower very capable and gifted children (Callahan et al., 2000), highlight the inadequacy of the traditional teaching model and make it imperative to implement differentiation.

Differentiation of teaching and learning is an adaptation to students' learning readiness, interests and learning style (e.g. Tomlinson; Tomlinson & Imbeau, 2010). The purpose of differentiated teaching is to build knowledge and expected learning outcomes for all students. Achieving better results maximizes motivation, cognitive and metacognitive development, and the performance of each student.

Both the research on differentiation of teaching and learning and the efforts to implement it highlight a number of difficulties and misconceptions which, based on research and intervention programs for the implementation of differentiation (i.e., Koutselini, 2008; 2017) confirm that its implementation requires training in real school and classroom settings, with procedures that allow for trials and feedback/retraining.

Action Research facilitates the participatory development of teachers in communities of learning and their orientation towards the different needs of students in mixed-readiness classrooms. The research into the professional development of teachers with Action Research (e.g. Reason & Bradbury, 2001; Carr & Kemmis, 1986; Koutselini, 2008; 2010; 2011; 2017) testifies to the change in teachers' perceptions and attitudes, from isolation and lack of trust in each other to the exchange of ideas and participation in collaborative groups. Gradually there is a change in the perception of teaching from covering the curriculum to reciprocal and student-centered communication.

The application of differentiation through Action Research procedures allows the teacher to observe both him/herself and the learner, to reflect, evaluate and re-act whilst simultaneously improving his or her pedagogical background and reconstructing any misconceptions that do not help in identifying the real causes of students' failure to respond.

Difficulties and Misconceptions

Although it is theoretically stated that effective teaching in mixed-readiness classes requires differentiation, its application is limited, as are its results, in relation to the expectations it carries. Apart from the fact that its application requires a sufficient time period of at least six months in order for results to begin to be observed, the main reason that explains its non-prevalence in everyday teaching has to do mainly with misconceptions. Misconceptions in research are defined as the wrong concepts which to some extent all people have, and which do not allow us to understand the real situation and/or the causes that trigger it. Their creation can be attributed to many different reasons (National Research Council, 1977): a) the difficulty in perceiving a known concept in a different cognitive environment and redefining it; b) the incorrect usage of empirical concepts to interpret scientific phenomena; and, finally, c) the conflicting tension between the existing concept/process as knowledge we already possess and new scientific data.

The notion of differentiation of teaching does not seem to be understood by the teachers themselves, who either commonly conflate the concept of differentiation with difference (e.g. different exercises for different students) or identify it with the undermining of the lesson's expected outcomes in order to "satisfy" the "weak students". As can be seen from research, the differentiation of teaching was perceived by students as synonymous with the reduction and simplification of the material and curriculum content for less capable students (Koutselini & Persianis, 2000).

Misconceptions about the concept of differentiation, its application, and the causes that lead to failure in achieving the expected outcomes are obstacles that leave no room for understanding differentiated teaching, and have been explored in a number of research programs and interventions. Focusing on these misconceptions and reconstructing them provides the basis for more effective understanding and design of differentiated teaching and learning.

During the one-year application of a differentiated-teaching program in a high-school classroom, the following difficulties were identified: a) how the material would be differentiated in daily lessons; b) how students' readiness, as well as their learning style, was to be determined in mixed-readiness classrooms, and; c) how the difference between ability and readiness was to be established (Erotokritou & Koutselini, 2015; 2016). These difficulties are related to the prevailing perception of the role of the teacher as an authority figure and authentic source of learning, on the basis of which it is impossible for him/ her to have a central presence and at the same time be understood by different students of mixed ability who coexist in a classroom.

The notion that the application of differentiation requires the teacher to "teach" and to "have the last word" simultaneously at different levels stems from the well-founded misconception about the role of the teacher (Resnick, 1989). A consequent misconception about the role of the teacher is the perception that teachers are fulfilling their contractual and pedagogical obligations by covering the curriculum irrespective of whether the students are learning or not. Perceptions of effective teaching are based on misconceptions about effectiveness as synonymous with covering the content of the curriculum/textbooks and/or as a response to the learning readiness of even a small number of students. That other students "do not read as much as they should" is a common excuse, which is also based on a further misconception that a student who lacks prerequisite knowledge should simply read about the subject more in order to learn.

The perception that many teachers have about differentiation is that it cannot be applied on a daily basis, only occasionally and for a limited period of time. This misconception is also accompanied by the widespread impression that differentiation is a series of "routine", repetitive and typical procedures. On the contrary, no typical or formal procedure can differentiate the lesson except the development of thought processes (thinking routines, e.g. Richardt et al., 2006), on the basis of which the learner learns to think and, at the same time, can make thinking "visible" to others. Any other procedural "routines", e.g. classroom organization, learning style activities, do not appear unmodified and typical, but change depending on the difficulty and form of the learning

task that students have to perform. Therefore, even these procedures cannot be characterized as routines in the literal or any other sense of the word.

If we refer to the work of Michael Apple (1995), routines in pedagogy have negative attributes because they deprive teachers and students from developing their skills ('deskilling' is the term he uses), as the teacher is constantly standing in front of the students in order to explain what the book is saying or to assign exercises.

There is also a misconception about cooperative learning and its role in the differentiation of teaching and learning. As a rule, teachers in secondary education consider that students sit in groups for the purposes of socialization and in order to discuss various issues. However, cooperative learning, not only as a way of organizing the class into groups but as a collaborative way of learning, is a key parameter for the application of differentiation, as well as for the combination of individualization and group work in various learning tasks (Koutselini, 2009). In addition, cooperative learning cannot be achieved without 'individualized' work within the group, when each student works in different activities spending time alone on executing specific and required learning subtasks, aiming at acquiring prerequisite knowledge. The time needed for different students varies and individualized work within the group respects the pace of each student giving them time to work on what they need in order to accomplish the main aim of the task.

Differentiation is not the same as working in groups or cooperative learning. However, without changing the organization of the classroom, differentiation in learning cannot be applied. Doing work individually and then subsequently getting help from the group before completion of a task are key milestones that can, based on the requirements of the specific course and the students, be implemented for better results. The teacher's say is limited, so that the students can work at their own pace and with their own learning style. Nevertheless, the role of the teacher becomes more important and more substantial when he or she is given the unique opportunity to offer help to each student individually, as needed during individual work. It is also the only opportunity which the student has to get individualized feedback while the rest of the students continue to work on other subtasks that lead to the execution of the assigned work.

The classification of activities into easy-difficult (with easier activities for the low-achievers and more difficult ones for the best students) which results from a misunderstanding of the concept of grading, creates a lot of sociological, pedagogical and other problems in the classrooms where it is applied. These problems are aggravated by distributing the easy tasks to weaker students and other activities to more capable ones. With differentiation, what makes it difficult for students to learn is, on the one hand, the prerequisite knowledge for scaffolding and building new knowledge and, on the other hand, the cognitive skills that allow for the organization of new knowledge and its connection to prior knowledge. Since the internal structure of thought and knowledge is constantly changing, the creation of new knowledge is based on what already pre-exists. Confusing the prerequisites of a task or the achievement of a specific goal with what is easy does not allow scope for the application of differentiated teaching and learning.

The input of learning style to differentiation of teaching and learning has been also misunderstood. All teachers know different theories about learning styles, but many do not know that as a preference – modality for learning that allows students to work in the way they prefer is not the main feature of differentiation but an auxiliary one. Working in different activities for accomplishing the same task is not enough for learning. Alternative activities, which enable students to work in different ways to achieve the same learning outcome, certainly help by motivating all students and facilitating their work. However, differentiation is not implemented, nor does it establish learning style as the key factor in differentiated learning, which thus leads to horizontal differentiation (alternative activities that lead to the same result). Priority is given to vertical differentiation, which means differentiation of activities that start out with the prerequisites, achieve the basics and give options for creative differentiation, over and beyond the main aim of the lesson. It is obvious that students cannot use their modality (the mode in which they prefer to express their thoughts), if they do not have the necessary background knowledge for the work.

Teachers often complain that curricula, teaching manuals, and textbooks do not help to achieve differentiation, as they do not prioritize knowledge and activities that will help the teacher. However, this notion is inconsistent with the principle that differentiation cannot be applied with the same materials and activities in all classrooms, simply because it is not a one-size-fits-all technique, but a philosophy that cannot be applied unless the needs of the students we have in front of us are first recognized and understood. Initially, teachers will need to identify the

basic concepts, ideas and skills of the subject they will be teaching, so that they can then assess the learning needs of their students and proceed with the appropriate planning of differentiated teaching in order to connect students' prior knowledge and skills with new knowledge and skills.

It is undoubtedly the case that the current trends in the development of curricula, with their construction of hierarchies and levels, from pre-primary to high school, contribute to the facilitation of the teacher's work and the implementation of differentiation. In the final analysis, however, the person responsible for implementing the most appropriate type of teaching and program development at a micro level is none other than the teacher. Through the development of micro-level programs, the teacher uses and shapes not only the practices in the classroom accordingly, but also the learning environment, the teaching materials, the activities, the time frame and pace of teaching and learning, in order to meet the needs of all students and to create equal opportunities in mixed-readiness classrooms.

Therefore, the teacher is the one who is called upon to develop the curriculum at a micro level by adapting it to the needs of his or her students, and to proceed with an "operational analysis" of the situation he or she faces in mixed-readiness classrooms. The pre-determined textbooks and the rush to cover the material exert on the teacher what Michelle Apple has very aptly called "technical control" (1995, p. 128). Pre-determined teaching materials/textbooks and strictly predefined activities are a means of technical control over teachers and a means of depersonalizing their work and life.

Improper strategies and meanings have also been attached, over time, to homework, which is an important pillar for differentiated teaching and learning. Students in a classroom differ significantly when it comes to the pace of their own learning, that is, they do not all learn at the same time, nor by making the same organization of their knowledge and activating prior knowledge to make new connections. Homework gives some students the opportunity to work harder on the fundamentals that have been emphasized in the classroom, at their own pace and with their own individualistic approaches, while for other students it is an opportunity to build on what they have already learnt in the classroom. Thus, homework should be creative and carefully hierarchized to further support differentiated learning.

The impression that has also been created in regards to how students are evaluated and what constitutes "fair" evaluation creates distortions both in the construction of exams and in relation to what criteria will be used to assess their work and evaluate the students. It should be clear from the outset that each student is evaluated in comparison to him/herself, that is, to his/her previous individual performance rather than to that of others. Each student is competing with him/ herself in order to become better and constructing new knowledge, thus every level of progress is evaluated positively. Planning to differentiate teaching should always begin with our knowledge of students, with an assessment of the level of learning they have reached, their learning style, their interests, and their level of commitment to their own progress. The selectively misunderstood perceptions outlined above have been stressed in long-term research and teaching experiences with teachers. The purpose of highlighting them in this article is so as to answer the question which teachers very often pose: **How is it possible, in a class composed of twenty-five students, to teach each student based on his or her own knowledge gaps and needs?** The final answer will be extracted in the conclusions of this article.

Constructivism and Differentiation

It is important to understand that differentiation is not a technique or a teaching method but a pedagogical theory with a strong philosophical background, which applies and extends basic pedagogical, psychological, and sociological principles. Without the theory of constructivism, for example, we would not know much about what is applied in relation to differentiation, such as the need to activate prior knowledge, the coding processes involved, and the role of cognitive conflict.

The concept of differentiation in teaching and learning is based on the learning theory of constructivism, which argues that learning is a process of constructing personal meaning, meaning that depends on the prior cognitive and emotional schemas of each student, their mode of activation, transformation or enrichment. The most important contribution of the theory of constructivism in program development and teaching and learning is the general principle that learning does not depend on what the teacher says but on whether what he or she says or does activates and enriches the student's Knowledge. In this process the prior knowledge affects what is the result of new or modified knowledge an individual will construct from learning experiences (Philips, 2000). However,

because learning is not just a cognitive or an automatic development, the participation and emotional acceptance of the processes and the learning environment by the students themselves is of great importance in the process of differentiation.

Without the constructivist theory we would not be able to theorize and apply differentiation, since, from another point of view, differentiation is the philosophical framework and the teaching process for the construction of knowledge for all students. Each new piece of information needs to be processed differently by the learner in a way that makes sense to the learner and can be connected to prior knowledge. Different connections of knowledge by the individual student make it difficult or easy to process the new information in an effort to scaffold and construct knowledge. Thus, knowledge is organized and cumulative, self-regulating and dependent on existing knowledge, which differs from student to student although seated in the same classroom.

Therefore, the goal of applying differentiation is to meet the different needs of students of different readiness to learn from a monolithic teaching for all, of different interest, existing knowledge and learning profile. The term mixed-ability classes does not suit in a pedagogical environment with high expectations for all children, an environment built on the assumption that different achievement does not always reflect different abilities, but different or lack of prior necessary knowledge. Many of the proposed approaches in the literature refer to differentiation for gifted where acceleration and grouping according to the ability have been the main means for corresponding to their needs. Many of these practices and differentiation methods are based on customizing schooling for individual learners, where each student can, if need be, move forward and leave behind the rest of his/her peers. The learning environment in mixed-readiness classes, as is the case in school classrooms, differentiates children not on the basis of their ability but on the basis of how ready they are to benefit from a lesson addressed to all, a non-differentiated teaching. They are students that they are ready because they do have the prior knowledge, students who are not ready lacking the background knowledge, and students who may need acceleration, different pace, and more creative and skillful tasks.

Differentiation entails having high expectations for achieving the expected learning outcomes for all students without fail, and the effort is for everyone to construct basic knowledge, regardless of the fact that each student will have different knowledge connections and a deeper or more surface learning or understanding of the subject (Biggs & Moore, 1993). In this theoretical context, the term “readiness” instead of “ability” (which implies mental ability), evokes much better what happens in classrooms where children of the same age coexist, without having the same background knowledge as defined in the curriculum content of particular classrooms.

Teaching begins at the point where the students are (Vygotsky- the zone of proximal development and scaffolding)) and is adapted to students’ readiness, needs, pace and learning style. The main question teachers have during the preparation of the course is what needs to be done so that during the same teaching period, the three levels of students (non-ready, ready, and beyond) can fulfil their concrete learning needs, with everyone achieving the learning outcomes of the course. Therefore, the priorities change when it comes to preparing a course in mixed-readiness classes, with the main focus being on the analysis of the prior knowledge that the student needs to have during the concrete lesson defined in the curriculum, and how new knowledge is analyzed by the teacher in order to help students to activate prior knowledge and connect or integrate new knowledge with what they already know.

Differentiation not only improves the performance of students with low performance and learning difficulties, but also meets the needs of gifted and talented children who have a different pace of learning or advanced knowledge in relation to the curriculum content. Therefore, in addition to basic and prerequisite knowledge, we also propose transformational activities, i.e. those that go beyond the requirements of the curriculum and are addressed to those students who are more prepared than other students to construct the basic knowledge and achieve the expected learning outcomes for all and they need to go beyond those. Generally, these students do not find intrinsic or extrinsic motivation when teachers repeat what they already know or move at a slow pace during the lesson.

Differentiated teaching is planned, but it is essentially a reflexive process. Its development depends on the students’ reactions to teaching and it is shaped accordingly by the teacher, who uses these reactions as a reference point. In a differentiated teaching setting, teachers are collaborators and participate in a way that encourages and promotes responsibility, as well as the development of attitudes and cognitive and meta-cognitive skills that go hand in hand with self-directed learning. Knowledge construction is the quintessence of independent learning and should be the key goal of all teaching.

The following excerpt from Action Research (Koutselini & Patsalidou, 2014) that involved teachers' training in the application of differentiation illustrates the importance of reflection and the re-examination of misconceptions:

"I believed that students learn when I present them with new knowledge and explain it in the best way possible. I wrote the most important points on the board and gave examples. But few students really engaged with the information or learned anything; the others just memorized things that they would soon forget in the next lesson and this disappointed me. By observing and correcting myself and the students at different times, the results surprised me in a positive way."

The excerpt highlights the misconceptions that still prevail in mixed-readiness classes today. Although when asked about their beliefs, teachers derive their positions from the learning theories, they do not apply them in the classroom, not only because implicit theories prevail at the time of teaching, but also because of the organizational pressures to 'cover the content' (Koutselini & Persianis, 2000). The misconception regarding the covering of the content as the main task of teachers is further reinforced by the misconceptions that the supervisors, counselors and inspectors themselves have when they come into contact with teachers.

In a differentiated classroom, both students and teachers learn. Teachers are constantly learning about how their students learn, assessing students' level of readiness in a variety of ways, and designing learning experiences based on specific students' needs and interests. Collaboration with students is essential in order to identify effective learning strategies and opportunities for each student according to their level, since the teacher's main priority is to organize effective and meaningful learning experiences and activities.

Constructivism is based on building, enriching or even reorganizing conceptual networks of concepts and cognitive schemas which are stored and easily retrieved to connect with new knowledge. Through the process of constructivism, the use of students' prerequisite knowledge and experiences becomes the focal point of effective teaching. What happened at an earlier date and what the students learned from the lesson of the previous day, is not the same as prerequisite knowledge, which can even be retrieved from earlier lessons from previous classes. It is also possible for prerequisite knowledge to be based on misconceptions or unsophisticated and surface knowledge, so investigating these misconceptions on the part of students also marks the teacher's first step, which is to create the environment in which such misconceptions can be expressed, brought into conflict with new knowledge, and subsequently reconstructed.

In differentiation we do not share different activities with students; all students start with the same activity and move on, until the teacher stops them to examine the prior-required ones in their group first. In such an environment, the most competent students will have already progressed by doing individual work, whereas some may still be stuck on the required activity. If this is the case, the teacher has the ability to approach the less competent students and to help them. Otherwise, they are re-taught the activity as a whole and then the students can return and pick up from where they left off. The main characteristic, therefore, of a differentiated class is that not all students need to work on the same activity.

The way the classroom and the activities are organized help to differentiate the time that each student needs to dedicate to each part of the task, and therefore during individual work each student can proceed to the next step or activity without having to wait. However, like all team members, the student who has moved on from the first task or tasks has the chance, when asked by the teacher to stop individual work, to return to the first activities indicated by the teacher, in order to check progress and to ensure the collaboration of everyone in the learning process. The role of the teacher and his or her position in a classroom where differentiation is applied changes significantly. The teacher is no longer at the centre or forefront of the classroom and does not monopolize teaching time whilst delivering the new lesson to the students. The teacher is among the children who are working either individually or in groups, not necessarily in the same activity, monitoring and supervising their work, and teaching each one individually, in small groups or as a whole, when required. Students can engage in written assignments, reading, and the exchange of ideas within the group. Such a form of teaching runs smoothly, and the classroom becomes a learning "lab" or workshop.

This workshop also presents different types of differentiation:

Differentiation in terms of result: the same wide range of activities and tasks is recommended for all students, but the expectation in a daily lesson is for all students to build on prerequisite knowledge and to acquire basic concepts, skills, or theories

that constitute the goal of the lesson and indicating the lesson's expected learning outcome for all students, so that no one left behind. At the same time, there are opportunities for those who can go beyond the fundamentals, that is, beyond the main goal of the particular lesson.

- Differentiation in terms of content: the same skill is developed in a different context (e.g. literary or informative text, mathematics, history, etc.) based on the preference of the student, but also differentiated in terms of length and level of difficulty.
- Differentiation in learning activity: different students have different learning styles. They can therefore handle the same content and successfully approach the same task at the same level, but in different ways and through different activities.
- Differentiation in the pace of the lesson in the classroom: The restriction of the teacher's role and the opportunities for the students to work either individually or cooperatively, thus allowing them to work at a different pace.
- Differentiation in terms of feedback, so that the teacher can respond to the needs of each student individually, depending on the difficulty each student faces in doing specific tasks.
- Differentiation in terms of the degree of difficulty of the teaching materials on which students have to work in order to achieve the same goals and learning outcomes.
- Differentiation in terms of the learning environment: collaborative, individual, technologically developed, experimental, etc.
- Differentiation in teaching and learning methods: some students may, for example, work better through an instructional scaffolding model, other groups of students may wish to focus on problem-solving activities, and some students through asking questions while working on a strictly structured or semi-structured activity or task.
- Differentiation in the way the class is organized, as some students prefer to work individually, some in groups, and some individually or in small groups with the teacher.

Differentiation as a school approach

The training of teachers is based on the critical participatory model, which is established on the principle that educational change is dependent on how teachers perceive teaching, as well as the context in which they apply it and what skills they have acquired to reshape it. Teacher training entails the restructuring of the professional culture of teachers, as well as the deconstructing of misconceptions, and this can only be achieved through meaningful dialogue and relational dialectics, reflection and critical introspection of the role of the teacher and his or her perceptions.

The Action Research Process has been successfully tested as an effective way for achieving the above aims (i.e., Carr & Kemmis, 1986; Reason & Bradbury, 2001). It creates an environment for the participation and action of the teacher, in contrast to many educational training programs (in essence informative ones) where educational authorities simply recount theories and information. In Action Research, meaning is not located in the experience itself or even in the theory, but in the analysis and understanding of the experience by all parties involved.

Research projects have shown that a school policy on the differentiation of teaching and learning facilitates teachers and brings quicker and better results, without this suggesting in any way that teachers themselves are unable to implement the differentiation of teaching and learning in their own classrooms through effective lesson planning and delivery techniques.

An intervention program in 32 primary schools in Cyprus showed that the interaction and supportive climate between teachers and between teachers and management enhances the motivation and skills of teachers as regards the implementation of differentiation (i.e., Koutselini & Patsalidou, 2014; Koutselini, 2015). The teachers themselves emphasize in their interviews how encouraging the efforts and active cooperation of the principals have been:

"We gained greater self-confidence when it came to applying new approaches."

"Cooperation gave us motivation and incentive."

"Although initially two of our schools declared participation, in the end all those who teach the course – as well as teachers in other classes - participated."

“The interest and participation of our principal reinforced and gave value to what was happening.”

The effective implementation of the in-service development of teachers on a school basis needs to be founded on the metacognitive skills of the teacher, on the one hand, and on the development and awareness of the teacher-pedagogical role of the principal, on the other as it is the principal who will value and support what teachers try providing motivation for collaboration and duration of their efforts (Koutselini, 2015). The development of metacognitive skills via school-based programs is observed gradually and at different level in each teacher who is obliged to observe the results of the applied actions, to reflect on and self-evaluate his or her performance, to share experiences with colleagues, and to aid in the joint decision of new courses of action and better results.

The interaction between teachers, mentors and the school management creates the supportive environment which essentially contributes to the development of teachers. The most important result of the innovative pedagogical action of applying differentiation in specific subjects for an entire academic school year is the change in school culture, the relationship between teachers and between teachers and management. Hierarchical contacts become collaborative relationships with the end-goal of achieving better teaching and learning outcomes.

The application of differentiation necessitates, but also facilitates, the change of perceptions and deep-rooted misconceptions, such as that the teacher is working “behind closed doors” like a lone wolf. Intra-school support and cooperation presupposes the acceptance of the principle that differentiation cannot be applied overnight. It takes actions and reactions, reflection and change, good planning and practice, so that teachers can observe the advantages of the cyclic endeavor of action research where the results define the next steps. Research has already shown that in order to successfully introduce differentiation into everyday teaching practice, the teacher must take slow and steady steps that allow introspection and observation of the experiences of both, students and teachers.

However, the most important stage for differentiation is not its gradual implementation in the classroom, but the drastic change in the teacher’s preparation for the implementation of this differentiation. Collaboration at school and in groups supports this effort and encourages the implementation of differentiation. Change is not easy, especially when for a number of years teachers have sufficed themselves with preparing the content of daily lessons and the exercises contained in the teaching textbooks.

Changes in teacher preparedness are based on four basic questions which teachers must ask themselves every day:

- What is the purpose of today’s lesson: Why am I teaching this lesson, and what am I trying to achieve for all my students?
- What basic knowledge, skills, or attitudes do I need in order to achieve this goal?
- What is the necessary prior knowledge: What do students need to know in advance?
- How do I satisfy or meet the needs of more gifted children in the classroom?

It is not easy to change your preparation as a teacher, and this essentially becomes a problem-solving procedure. The testing of ideas in communities of learning creates the supportive atmosphere needed for answers to these core questions, which then leads to an in-depth analysis of the issues surrounding the curriculum content: basic and prior-prerequisite knowledge upon which new, transformative knowledge will be built.

The alternating choices of methodology, activities and classroom organization, as a subject of discussion in groups, enriches teachers’ choices and enhances their confidence. It has already been pointed out that the differentiation of learning does not coincide with the differentiation of learning styles, which offers options to the student regarding activities that lead to the same result, but through a different method of working (e.g. to underline the basic ideas in a short text or to include them in a paragraph or to represent them visually). However, content differentiation, so that all students can achieve the objectives of the lesson, requires much more preparation than the creation of different activities that lead to the same result.

The experience and research data collected from the application of differentiation in schools has shed light on various misconceptions or a lack of knowledge when it comes to the application of collaborative learning, which in many cases is a basic way of organizing and running a classroom, and a precondition for applying differentiation. The main safeguards for effective collaboration in groups are the organization of students in mixed-readiness teams, the breaking down of duties into various hierarchies and levels, the checking of individual parts and not just the final and holistic result, and obligatory individual work before collaboration so that all

students can understand their mistakes and knowledge gaps. The teacher ensures that typical mistakes are not made, such as that of appointing a group leader or representative to announce the final result. This is because all students, as members of the group, must be able to represent it and express their opinions and mistakes which are not sins but the most productive step for construction of new knowledge and organization of the differentiation. Additionally, working for a long time on a specific task or activity without feedback from the teacher at critical points in the learning process, and without individual help to students where needed, may limit or even prevent the expected learning outcomes.

Therefore, the application of the differentiation of teaching and learning can be developed in three phases (Koutselini, 2008). The first refers to the preparation and preparedness of teachers (the academic phase), the second to the cooperation of the teacher, the student and the parents (the social phase), and the third to the actual teaching procedures in a mixed-readiness class (the teaching phase). Under these conditions, a strictly artificial and positivist kind of teaching is avoided, and teaching itself becomes enriched by Action Research processes and the social interaction of all the parties involved in the learning process. The school strategy for differentiation, as described above, involves all or most of the teachers in the same school unit in collaboration in communities of learning, negotiations, consultations, and wider participation in the design and re-design of the learning experience.

Conclusion

Differentiation requires systematic planning and thoughtful of teaching practice. Systematic planning, organization and proper management of the learning process are important factors of effective teaching, especially when the goal is to differentiate teaching in order to meet the personal needs of students of different readiness in the same classroom.

The need for teaching based on the real needs of the students rather than on the usage of undifferentiated textbooks should be the most important feature in teachers' planning in order to ensure effective teaching in mixed- readiness classes. The students in the classroom are of the same age, yet not all of them have the same learning needs, so we need to help them to fulfil those needs. This is the ultimate meaning of differentiation: Differentiated instruction to different students with different needs and the gradual development of skills and learning strategies necessary for lifelong learning.

To return to our initial question: **How is it possible, in a class composed of twenty-five students, to teach each student based on his or her own knowledge gaps and needs?** This article has not attempted to provide a clear-cut, ready-made or straightforward answer, but to build upon the answer to the now classic question posed by teachers. It is a question that also arises from a misconception of what differentiation is and how it is applied, and constitutes, on the basis of current research, the main misconception that thwarts any attempts to implement differentiation.

In every mixed-readiness class, students' needs are not determined by the number of students in the class, but by their level of readiness to achieve a specific goal. The readiness levels, based on the analysis in this article, range from three to five, and refer to students who are ready to accept the lesson of the day (level 2) and to learn, to students who do not have all or some of the prior-prerequisite knowledge and skills (level 1), as well as to those students who can execute tasks quickly and with ease, and consist of the most prepared students that need enriching learning challenges (level 3).

What prerequisite knowledge means should also be clarified. Based on the relevant research (and taking into account that we are not talking about illiterate students who need to be enrolled in a special literacy program), this kind of knowledge is measurable and quantifiable. It refers to specific theories, concepts, and processes without which new knowledge is not built and the purpose of teaching a specific lesson in the classroom is not achieved. Prerequisite knowledge is, therefore, not associated with the curriculum content of all previous classes. There can be only ten students in one classroom and five levels of readiness, or twenty-five students and only two or three levels of readiness. If teachers experience this reality and acquire the skills and attitude needed to apply differentiated teaching and learning, they will never abandon them for the sake of merely flicking through the pages of the school textbook with students in order to cover the material.

Training in the differentiation of teaching and learning is not a procedure with an expiration date. Nor can the teacher be compelled to apply it if he or she has not adopted or espoused its philosophy and values of change after

encountering the problems inherent in the educational system. That is why the application of differentiation cannot be achieved by studying and becoming acquainted with its theories and practices, but through an awareness of the erroneous but well-established and systemically supported misconceptions about what teaching means, how learning is achieved, and the role of the teacher and the set textbooks. From thereon in, its implementation becomes a daily struggle of self-education and training in communities of learning on a daily school basis, through observations, reflection and change, in order to achieve results that reward the journey of teachers' professional self-development.

The solutions to problems that are presented during teaching and learning are not neatly handed down by experts, but are provided by the teacher, who realizes his or her key role in learning. This path is never linear but circular, and has as its core the assessment and fulfilment of students' needs in order to facilitate learning. This path from theory to practice helps the teacher to acquire skills that allow him or her to observe, assess and self-evaluate, suggest and improve, offering feedback on his or her choices and strengthening skills and self-confidence in a cyclical process of redefining him/herself and the students.

The active participation of the teacher in the preparation and implementation of effective teaching contributes to a change in misconceptions about teaching and learning, and to the establishment of the teacher's pedagogical identity, which, in collaboration with colleagues, students, parents and the school on a daily basis, lays the foundation for the school to become a learning lab and a community of learning (Hargreaves, 1998).

This change is experienced and appreciated by students first, as is evident in the words from student interviews after the implementation of an annual differentiation program in a Greek language course in secondary school (Erotokritou & Koutselini, 2015):

"The lesson was more interesting than in previous years. The treatment of the lesson has changed and we are in a much better position to participate [...] We have managed to change the attitudes of our classmates in teamwork, which was initially negative. Working in groups was a pleasant experience. All my classmates were more active and could get more and more involved over time."

The ability of teachers to exercise self-criticism in the course of teaching in a way where they can receive feedback and differentiate their work more effectively plays a decisive role in the success of a differentiated teaching approach. Experience has also shown that school policy on the implementation of differentiation frees the teacher from the "closed-door syndrome" and the reluctance to share with colleagues any difficulties and thoughts on teaching which may arise. At the same time, and through the cyclical processes of Action Research, cooperation in order to galvanize planning, action, evaluation, redesign and new actions not only enhances self-confidence but also the teacher's skills in particular, which facilitates the implementation of differentiation. The teacher learns to organize targeted activities based on the needs of specific students.

In the final analysis, students, teachers, principals, counselors, and the management team come to realize that differentiation of teaching and learning is not a method of teaching. It is a philosophy, pedagogical theory, development process, and a way of thinking about teaching that has as its starting-point the awareness and understanding that teaching can only begin at the critical point or juncture where the students are, or find themselves, in terms of their knowledge base, skills, and competence

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