

APPLICATION AND EVALUATION OF DIFFERENTIATION INSTRUCTION IN MIXED ABILITY CLASSROOMS

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Abstract

In a century characterized by multiculturalism affecting all aspects of life, in amalgamation of the demand for social justice and equal educational prospects for all, school failure experienced in most educational systems consist a solemn problem which prompts for solutions to be given through educational research. It is argued (Tomlinson, 2001; Koutselini, 2006) that traditional teaching methods can no longer support learning in metamodern mixed ability classrooms. There is a need for extensive research on teaching methods which are proficient to comfort with different educational needs of all students in a mixed ability classroom. Differentiation can deal with both, the chain reactions by increased diversity in mixed ability classes and the continuation of the phenomenon of school failure. Differentiation is not a recipe to be applied (Tomlinson, 2001a, 2005), it requires deep knowledge of the theoretical framework and differentiating process and the ways that theory is translated into action. In consequence high quality and continuous in service training teacher's training, the reconstruction of the curriculum and the creation of supporting educational material constitute main parameters for an affective differentiating practice. The research described in this paper consists an empirical research on differentiation instruction in mixed ability in the fourth grade primary school classrooms in Cyprus. Fourteen volunteer teachers after receiving high quality training on the theory and practice of differentiation instruction used differentiation instruction to teach language (greek) during a whole school year. The main aim of the research is to evaluate the effect of the application of Differentiation Instruction in mixed ability classrooms on academic achievement, on the development of competences and the self-image of students.

Introduction

Ineffectiveness of educational systems and their malfunction in corresponding to students' needs (educational, physical, mental, social etc.) consists one of the main characteristics of modern educational times. An outsized number of students in our days is led to failure, where another big segment is incapable to function beneficially and act critically towards emerged problems in a social environment marked by multiculturalism, by its orientation to knowledge and driven by technology and information. In an effort to clarify the factors that educe this problem prompts a twofold question. What are the main causes of these problems? and how school and especially teachers can effectively act accordingly in order to maximize academic achievement for all students? There are no optimism in answering these crucial educational questions on the whole through a single research. Nevertheless an experimental research on effective ways of teaching will enlighten teaching practises in mixed ability classrooms and will lead the way in facing the problem of school failure. Many researchers and scholars believe that the solution of this problem lays in the frames of differentiation theory and practice.

Current educational issues as mentioned above and the call for equity of education opportunities has led to the formation of mixed ability classrooms, where is believed that equity of educational opportunities can be achieved by teaching students corresponding to their level of readiness, their interests and their learning style, maximizing their opportunities for learning and growth (McLaughlin & Talbert, 1993). In this framework equity in education and social justice can only be met if teachers find the way to correspond to the diversity of their students (Gamoran & Weinstein, 1995).

Traditional and undifferentiated instructive approaches that do not facilitate the construction of knowledge for all students in mixed ability classrooms are seen as one of the basic factors causing this problem. Based on the idea that a change in instructive approaches can help overcome the ineffectiveness of educational systems, several fundamental questions arise. Which teaching approaches facilitates the construction of knowledge for all students in mixed ability classrooms? Is differentiation the most suitable and effective teaching approach for mixed ability classrooms? If differentiation constitutes the means for effective teaching in mixed ability classrooms what are its main characteristics, and what are the presuppositions for applying effective differentiated practice?

The research presented in this article is mainly an effort to put differentiation in practice by meeting all the main presuppositions for an effective differentiated practice and evaluate its application and its results quantitatively and qualitatively aiming to find a way to act in the best interest of students in mixed ability classrooms.

Literature Review on Differentiation

Theoretical Background: Different traditions of Differentiation

Society has experienced radical changes that altered its needs and the way that these needs must be met. Although education is supposed to be the system responsible to educate future citizens in response to society's needs and characteristics, this was not the case. Education on the whole could not follow and respond to the immense rhythm of change although some education aspects have gain new meanings leading to criticism on educational practices and theories used in the past. Technocratic and positivist tradition that once supposed to be the means to mediated the society's needs was strongly criticized (M. Apple, 2003; Guba and Lincoln, 1989; Habermas, 1978; Giddens, 1976) for its highly content based curriculum and its prevailing testing rationale, that was shown to

be ineffective, producing citizens with high test grades but without any real life skills and thinking abilities. In this sense technocratic and positivist teaching practices constitute a “one way street” in the way knowledge is taught and oriented, in order to ensure political decisions (B. Ryann, 2003) revealing the hidden “target” of such practices.

As a response to the criticism of technocratic and positivist tradition, Tomlinson suggests the theory and practise of differentiation. Differentiation of teaching is proposed as a change of teaching process based on teaching routines that correspond to the large span of students’ differences in mixed ability classrooms, such as student’s readiness, interests and learning style (Tomlinson 1999, 2001). Bearne (1996) identifies differentiation as an instructive approach by which teachers modify the curriculum, their teaching methods, the educational sources used, the learning activities and the evaluation methods according and in correspondence to students’ differentiated needs, in order to maximize the learning opportunities for every student.

Differentiation can be also characterized as an innovating way of effective teaching and learning. The practice of differentiated teaching cannot be found in readymade recipes for teaching. The search of readymade lesson plans for differentiated instructions by teachers can only suggests their ignorance on the theory of differentiation and the way to place this theory into their everyday teaching practice. The lack of awareness over the theory and practice of differentiation prevents teachers from using this instructive approach and condemn to failure any attempts in doing so. The variety of different forms, different categories and different techniques or strategies of differentiation can only be used effectively when chosen by teachers, based on the factors that determine the needs of the students. The learning style, the interests, the talents, the skills, the competences and the cultural background of students that will be previously studied by the teacher will guide his final decision concerning the kind of differentiated teaching to be chosen (Hall, 2002).

The theory that supports differentiated teaching has great impact in teaching all over the world bringing major changes in the way we envision and practice teaching. Although we have witness curriculum changes according to differentiation, literature lacks of research evidence supporting differentiation theory, limiting its support through individual theories based on which differentiation theory and practice has been developed. However, a literature review reveals a number of studies and research attempts that show and support the enhancement of teaching and learning through differentiation (Tomlinson 1999, Good and Brophy 2003). Precedence in academic outcomes in standardised tests of students that received differentiated teaching compared to students that were taught by traditional teaching methods (one method fits them all) was shown by Gayfer (1991) where McAdamis’ (2001) research shows an important academic improvement of students with low academic outcomes after differentiation of teaching.

Differentiation, as suggested by Tomlinson is only a step away from positivist teaching methods and practices as the shifting of interest in favour of students and their personal characteristics was not actually for the student’s best interest since crucial personal and other factors that affect and determine learning were not considered. In this first differentiated proposal equity was sacrificed for better test grades making education a mean for the reproduction and the creation of social and academic inequalities (Apple, 1979). Education in this sense is shaped and formed responding to society’s call for the rise of standards, through strictly countable tests and their results. Educational sociologists all over the world criticise both the emphasis given by neo-liberal curriculum on growth and development of students as a product (working force) and the focusing on testing and standards by neo- conservative educational policies. Apple refers to these theories based on which curriculum is being developed as dangerous and very simplistic (Apple 2006; Apple, et al. 2003).

In contrast to positivism and technocratic educational ideas, the proposed meta-modern curriculum by Koutselini (2001) consists a mainframe for curriculum development away from the

negative side-effects and disabilities of modernism. Meta-modern curriculum offers a critical framework for the theory and practise of differentiation where students are placed in the centre of educational process and teaching is design based on their needs. Students in a differentiated teaching are being carefully studied by the teacher in order to distinguish their individual characteristics, their needs and other factors that influence their learning which are situated both at school and family environment. It is important to consider social and other factors of students that influence learning (Koutselini, 2001) since it is proven that learning can be affected from factors like the socio-economic status of family (Reyes & Stanic, 1988) and self-image of the student. Student's characteristics and needs must guide the design and reflective teaching practise.

Research supports the connection of self-image, self-perception, self-concept of student, with various student faculties (e.g. school record, reading faculty) and further more shows that students with a positive self-image score higher academic outcomes (Sygoliotou, 1997 Chapman, Lambourne & Silva, 1990). Literature also supports a positive correlation of self-image of children with the educative and socio-economic level of their parents (Flouris, 1989; Mpartha et. al. 1982) where the perception for the degree of student's social acceptance from children of the same age, as well as the degree of acceptance of students actions, correlate with a self-awareness for his behaviour. Positive self-image is mostly determined from the educative level of the family and other family factors (familial structure, educative-economic level, special factors of family environment, family background). In differentiated teaching all such factors must be accounted and support the design of high quality teaching process.

Differentiation of teaching in a metamodern curriculum is not actually a teaching process but must be seen more as a "learning process", where emphasis is placed on the interaction of student, knowledge and teacher in an open and flexible learning process. Teachers in the case of a metamodern curriculum act as professionals, diagnosing the educational needs of students and plan the learning process accordingly (Koutselini 2001, 2006). Differentiated teaching is the learning process in which students are facilitated to construct their knowledge by maximising motivation for cognitive and metacognitive growth that will eventually improve academic outcomes for all students (Koutselini & Gagatsis, 2003) and strengthen their explanatory faculty.

Differentiation of teaching in the frame of constructivism constitutes the answer in facing the problem of increasing diversity and the phenomenon of school failure in mixed ability classrooms. Construction of knowledge is a unique personal learning process, where each and every person understands and gains meaning of new knowledge based upon his prior knowledge and his personal beliefs and needs. In a constructivism learning process where differentiation is applied, a child centred teaching approach faces every student as a unique "biography" and not as a copy of the same picture. Consequently, differentiation is the correspondence to the needs of each student and the facilitation of construction of knowledge for each and every student that cannot be considered as a transfer of knowledge (Koutselini, 2006). Throughout differentiated teaching, an opportunity will be given to students to put theory into practice based on their prior knowledge and simultaneously they will be able to investigate the connection of knowledge gained with knowledge from other subject areas. (Koutselini, 2006).

Differentiation in Classroom: From theory to practise

The translation of differentiation theory into practise requires in depth knowledge and analysis of the theory it self. Theory simply sketches the framework and the basic lines of differentiation where the teacher is the one to colour the lines and add the details. "Details" gain new meaning of the whole process since they reveal the overall needs of students. In this context teachers provide

students with various, interrelated, well planned educational activities based on their prior knowledge and dexterities, by adapting and regulating the curriculum, according to the diversity and differentiated needs of the specific students (Mitchell & Hobson, 2005). The uniqueness of each and every student guides the planning and the course of teaching (Willis, S. & Mann, L. 2000). Teaching which accomplishes, through the exploitation of various methods, means and materials, to correspond to the particular needs of each child is a clear example of effective differentiated teaching.

Literature reveals that differentiated instruction can be applied and achieved by changing different aspects of teaching. The main areas of diffusion of differentiation are the adaption of what is taught (content), the encouragement of critical thinking (process), the provision of a variety of opportunities for students to demonstrate and prove what they have learned (product), in a pleasant and secure environment, reinsuring that most students including students with learning difficulties get an opportunity to achieve high academic outcomes (Smutney, 2003 Lewis & Batts, 2005). Tomlinson (2001, 2006) suggests that differentiation can be allied as differentiation of content, process, product and differentiation of learning environment and evaluation methods. Although this implies to good way to start differentiation, differentiated instruction has not only to do with what goes on into the classroom and the school but goes further by taking into consideration other factors affecting learning outside the school borders. Koutselini believes that teachers can differentiate their teaching aiming to correspond and fulfil the needs of all students, according to their readiness, their learning profile, their interests, their socio-economic status and their self-image (Koutselini, 2006).

Differentiation by content is focused on what all students should learn and it is based on the construction of “core” knowledge and dexterities ensuring the access of all students to information resources. Differentiation by process consists of the use of differentiated activities in a way that all students comprehend the content and conquers the knowledge, while differentiation as product consists of different ways of application and presentation of knowledge learned by students through their final work (final result). Differentiation of the learning environment encompasses the ways by which classroom and school environment can be differentiated (space arrangement, temperature, furniture, means, access to means, aesthetics, colours) in order to create a comfortable, friendly and secure environment that supports and promotes the learning effort of students. Differentiation however can also be seen at the level of evaluation of students’ final work (product), by differentiating the ways and means used to evaluate the learning outcomes of students.

The type and area of differentiation is a decision to be made by each teacher, taking into serious consideration the particular needs of each student (Smutny, 2003). An important element that all teachers should consider, when attempting differentiation, is that the starting point for every student is different regarding student’s competences, learning profile and dexterities (Schlechty, 1997; Smutny, 2003). In order to deliver a highly effective lesson, learning process must be aligned with the student’s level of readiness (Vygotsky, 1986). If the level of activities is below students’ readiness level, then the learning process becomes boring and ineffective. In contrast if the level of activities is higher than student’s readiness level, the student is disappointed and loses his interest and consequently the learning process is once again ineffective.

Over the years educators and scholars have been studying school and teaching factors and how these factors support effective teaching and simultaneously affect learning positively or negatively. Beyond the school factors that influence learning, other factors that also influence the learning procedure and are located beyond the school environment should also be considered if we are about to determine effectiveness on the whole. Such factors are the socio-economic status of students, their self-image, as well as other factors that are direct or indirect connected with students’ life and might affect their learning. Research has shown that the family socio-economic status is related with the academic outcomes of students (Reyes & Stanic, 1988) where there is also a strong correlation of

academic achievement and students' self-image (Sygkoliotou, 1997; Chapman, Lambourne & Silva, 1990). School and teachers should find the way to mediate any negative effects from such factors and take advantage of factors that affect students' growth and development positively.

Differentiation is an on going dynamic process that requires knowledge, skills and personal involvement in order to be applied effectively. Differentiated instruction is a part of the whole puzzle of differentiation. In order to have effective differentiation all the pieces of the puzzle must take their place. Based on Oaksford and Jones (2001) diagram of the course of differentiation, which presents an overall approach of differentiated teaching, we propose a more inclusive diagram aiming to present clearly all the main factors that determine differentiation in practice. This diagram clearly shows the main factors that must be taken into consideration when planning and delivering differentiated instruction. Firstly there is a need to determine all the factors that might affect the learning process. Such factors are the readiness level, the interests, the learning profile of students and other factors that influence the learning and are to be found outside the school environment. Family factors like the general family socio-economic and psychological factors, like self-perception (self-image) of students, can affect the learning process and consequently influence and determine learning outcomes. Secondly, there is a need to show the reflective character of differentiation by promoting a continuous evaluation of students. Continuous evaluation leads to modification of teaching and planning according to emerged needs of students making differentiated teaching a highly reflective process to students' learning needs. Finally, differentiation of the learning environment must be promoted in order to facilitate the learning process for all students (Diagram 1).

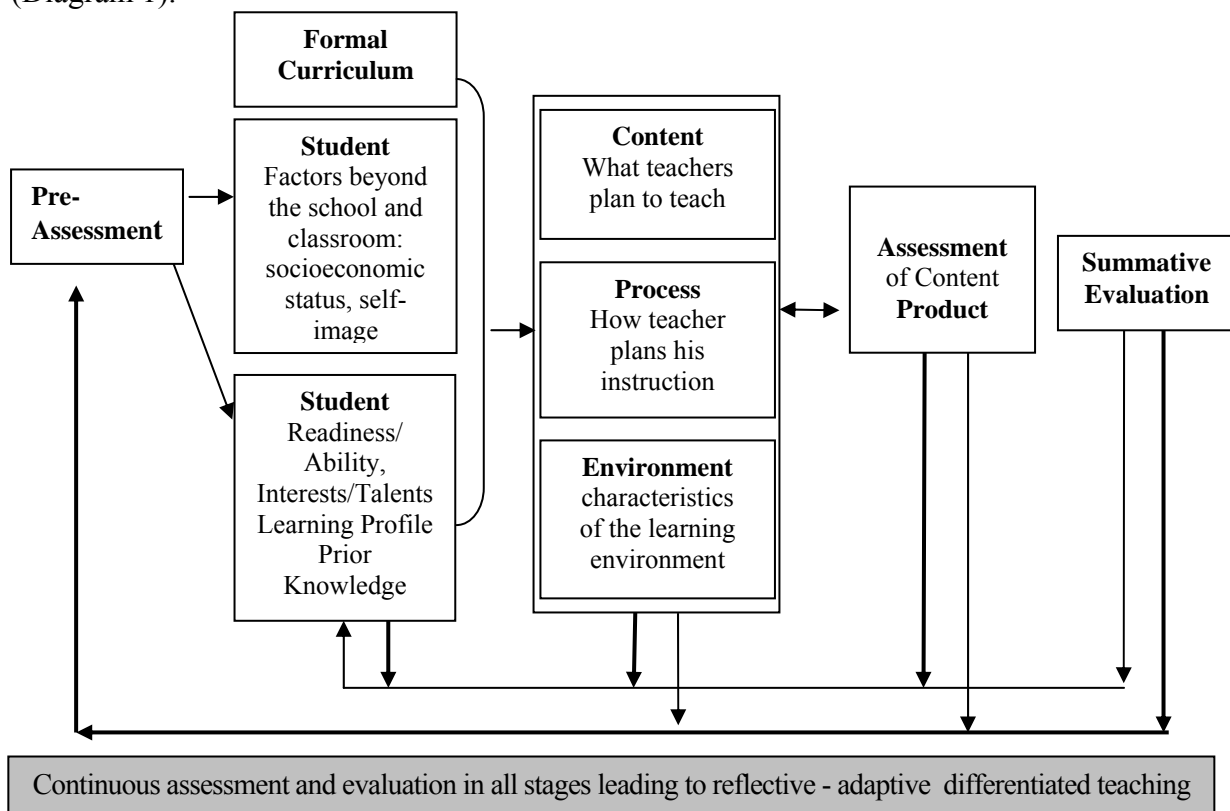


Diagram 1: Route of Planning and Application of Effective Differentiation Instruction in Mixed Ability Classrooms (Valiande & Koutselini, 2008).

Many techniques and strategies have been developed and used in every day teaching practice in order to differentiate learning process. Although testimonials of teachers using these techniques show that their use is plausible Koutselini supports, that the philosophy of differentiation cannot and should not be enslaved and exhausted in the frames of techniques and practices of differentiation (Koutselini, 2006). Most of these techniques have been used effectively with specific students

groups with particular characteristics (talented children, children with special needs, foreign speakers etc.). Consequently, their validation and their accountability have not been tested through extensive and serious experimental research in order to ensure that these techniques are as effective for any group of students. Teachers need to have a solid knowledge of differentiation techniques, but primarily they must be focused on examining the needs and the characteristics of their students in detail, having in mind all the factors that might influence considerably students' learning (Koutselini, 2006) and then decide whether to use some of these techniques or differentiate their teaching in other ways to match students needs and characteristics.

There is a debate between scholars in order to determine if differentiation is mostly a pedagogic approach, an organisational approach or an approach that encompasses both the pedagogical and organisational characteristics. Starling & Saunders (1993) support that differentiation should be faced more as pedagogical approach rather than an organisational one, due to the constant and deep involvement and participation of student and teacher in the learning process. On the other hand Koutselini (2001, 2006) believes that differentiation is simultaneously an organisational and a pedagogical approach, allowing all children to achieve their personal targets, which are directly related to their personal needs. Organisational and pedagogical differentiation constitutes of two different aspects of the same concept and can be found in harmonic combination in differentiated instruction. The work of the teacher on the whole and his teaching practises and techniques constitute the pedagogical approach of differentiation. In order to accomplish a successful pedagogical differentiation approach there is a concurrent need for an organisational differentiation, which concerns matters of classroom management, education materials and alternative ways of teaching and evaluation (Koutselini, 2006). Consequently differentiation on the whole is the adaptation, organisational and pedagogical, in order to correspond to different needs of students in mixed ability classes. In mixed ability classrooms that are mainly characterized by diversity, differentiation is the only way to offer all students the best possible teaching and learning experiences and treat each student as unique, by recognizing his personal abilities and offering him opportunities to develop his dexterities through various techniques (Mulroy & Eddinger, 2003; Tomlinson, 2001a; Tomlinson & Kalbfleisch, 1998; Tuttle, 2000; Koutselini, 2001).

Main Presuppositions of differentiated instruction

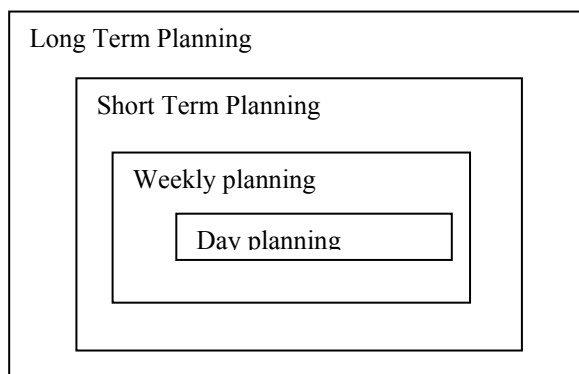
Effective application of differentiated teaching, based on educational literature and daily teaching experience of teachers is connected with specific presuppositions from which some of them are of a decisive importance. Differentiation of teaching is not a lesson plan with specific guidelines to follow and is not something a teacher does in his spare educational time (Tomlinson, 2001a, 2005). Differentiation is a multifunctional and a demanding instructive approach which requires an excellent knowledge of its theoretical framework for an effective translation of theory into practice by the teacher. This can only be feasible through continuous and scientifically organised training of teachers on differentiation issues.

Teachers constitute the means, but also the key to achieved concretisation of any innovation or change in the educational system, particularly when this change has to do with teaching. Teachers' development and application of innovations are interrelated and interdependent so that no plan for educational change can take place without a corresponding plan for teachers' development (Fullan and Hargreaves 1992). According to Fullan "continuous development of all teachers is the cornerstone for improvement and reform. Professional development and school development are inextricably linked" (Fullan 1991). Therefore, teachers that will be called to apply any reform, change or innovation should be properly informed and trained, to get the feeling that this effort is partly theirs and the success of it lays in their quality of work. In order to correspond and materialise a new educational proposal teachers need time, to get informed and trained, whereas at the same

time there is a need for communication with other teachers for exchanging ideas and discussing problems arising from practice. Differentiation as a multileveled, complex and synthetic teaching approach requires numerous and huge changes in the way that teachers think and act in their every day work in order to solidified differentiated teaching (Leader, et al, 1994).

Research and studies from international literature regarding differentiation of teaching in mixed ability classrooms reveals that although teachers acknowledge the diversity of students, mainly in the academic sector, most of them do nothing to respond to this diversity (Tomlinson et. al. 2003). Even in some cases where efforts for differentiation were made these were ineffective (Schumm et. al 1995; Starling & Saunders, 1993) and differentiation constituted of teaching improvisations without planning, as it is expected in a differentiated teaching approach (Wehrmann, 2000). Tomlinson says that teachers need to be motivated and determined, in order to differentiate teaching. However, to be determined is not enough. Teachers need to have a deep knowledge of the theory of differentiation and the way theory can be translated in practice, in order to adopt differentiated teaching (Mary Ann Coley, 2005). Furthermore differentiation is a teaching approach for the concretisation of which there is a need for development and growth of concrete planning and teaching dexterities by the teachers. Great deal of time is needed in order to develop and established such dexterities.

Teachers differentiating their teaching for the first time must not rush into it. On the contrary differentiation must be brought into practice little by little so that both teacher and student have the appropriate time to learn and adapt to this new way of working and learning. Wehrmann (2000) says that to achieve successful differentiation teachers should take slow, solid and regular steps that resemble the baby's first steps. But most of all, differentiation requires a systematic planning of instruction process (Riley, T. In press). According to Clark & Callow (1998) systematic planning, organisation and management of learning process constitute one of the most important factors of effective teaching, particularly in the case of differentiation. The course of differentiated teaching can be seen in three hierarchical steps (Tomlinson, 2003). Initially, teachers ought to study the content to be taught, analyse it and verify the issues, the main ideas and the basic dexterities that all students must concord through teaching process. Then, teachers should evaluate student's prior knowledge and dexterities and report on their educational needs that will finally guide the planning of differentiated teaching, in a way that will connect students' prior knowledge and their dexterities with new knowledge and dexterities. The planning for differentiated teaching, according to Clark and Callow (1998), is stated beyond daily or weekly planning and is extended in short-term and long-term planning (Diagram 2).

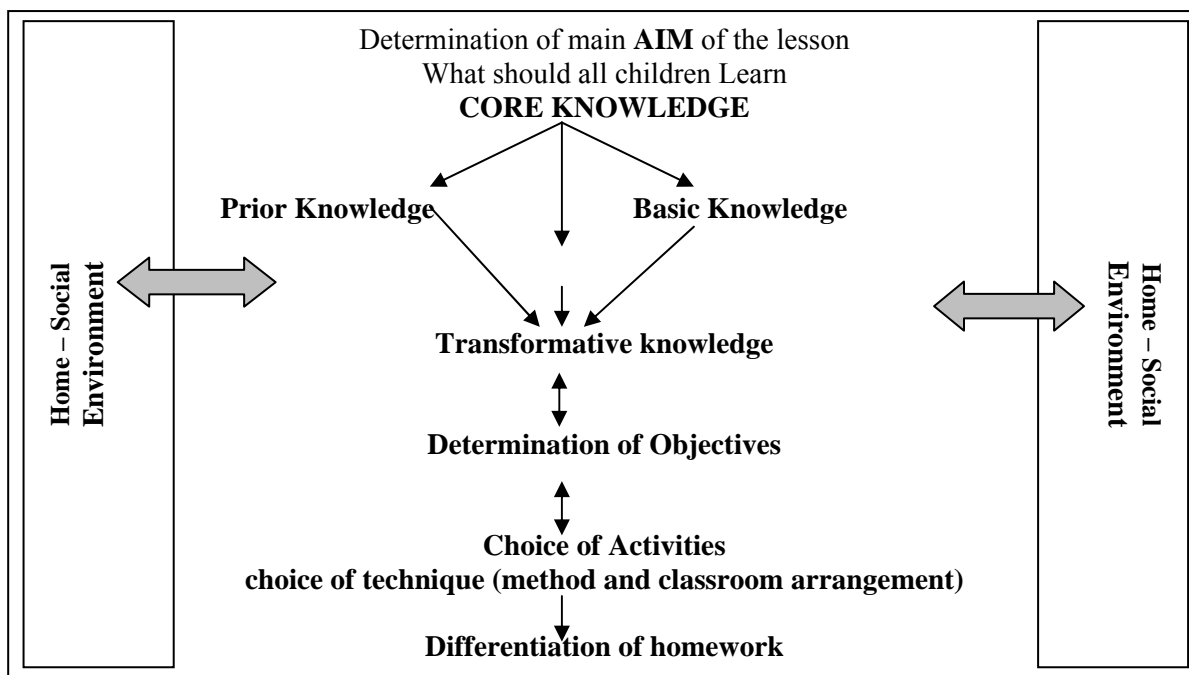


*Diagram 2: Clark & Callow (1998),
Systematic Planning the Course of
Differentiated Teaching*

Koutselini, analysing extensively the processes of planning of differentiation based on research on mixed ability classrooms in Cyprus, supports the existence of basic stages for the preparation, planning and application of differentiated teaching. The planning of differentiation begins with the determination of aim from which "core" knowledge (information, dexterities and strategies) is determined, crystallizing what all students must learn from a particular course. Then knowledge is

being categorized according to the content and the aim of the lesson in three main categories as basic (new knowledge to be learned by the course of the day), as prior or pre-requisite (knowledge that is essential in order to conquest basic knowledge) and metaschematic knowledge (knowledge beyond pre-requisite and basic knowledge which is addressed mainly to charismatic or advanced students). Finally objectives of differentiated teaching will be decided, based on “core”, basic, pre-requisite and metaschematic knowledge. The objectives will guide teachers’ choice of activities and his decision on the hierarchy of these activities according to their horizontal analysis in order to satisfy all different ways of thinking and learning (Koutselini 2006, p. 87) (Diagram 3).

Diagram 3: Preparation of differentiated teaching Koutselini M. (2006). Differentiation of teaching Learning in mixed ability classes: Philosophy and significance, approaches and applications. Volume A. Line: Curriculum and Teaching, University Cyprus.



The lesson planning process is based on the theory and practise of differentiation and it constitutes the foundation for an effective differentiated instruction. A divergence from the line of this process particularly in the first basic stages of preparation will lead to an unsuccessful effort of differentiation where teachers and students will get lost in the way.

Even though planning is the essence of differentiation, long before planning of instruction begins, the teacher must find the ways to learn almost everything about her/ his students, their educational, social, physical and psychological needs. The teacher must study and utilise these information, in order to plan a differentiated teaching process through which each and every student will construct the new knowledge based on their prior knowledge (Tomlinson, 1999).

Furthermore effective differentiated teaching is fundamentally based on the ability of the teachers to criticise their own work and act reflectively. Tomlinson stresses out that effective teaching is not a teaching process where students are kept occupied, but a learning process that helps students to develop further basic dexterities and leads them to grasp on main issues with importance for their life. In order to do so teachers must be flexible and well prepared to modify the aims, the means and the way of work according to students’ development on the spot.

Students are not the only ones learning through the differentiation teaching process. Teachers also learn a great deal by planning and developing a differentiated lesson (Hess Mary Anne, 1999).

As new teachers begin their professional life with a 'repertoire' of instructive practices that are consciously or unconsciously changed and are enriched and perfected, the same happens when teachers differentiate their practice. Experiences that teachers acquire through differentiated practises help them develop new teaching practises and strategies that help them adapt their teaching to the needs of students.

Teacher's role in classroom where differentiation is being deployed changes considerably. Teacher is no longer at his desk in front of the classroom or by the board teaching and monopolizing learning time by delivering the new content via direct teaching. The teacher finds herself/ himself among the students that work individually or in groups, moving in the classroom watching and supervising on their work. Teachers' movement in the classroom is not random. He goes where he is needed the most, offering mental scaffolding to students helping them to move a step further in the road of knowledge maximising their abilities and capabilities. In differentiated teaching classroom students' deal with written and reading work, they discuss and support their opinion in their group and with the whole of the classroom. In other words students are not just good listeners they are active participants engage in their own learning process. A differentiated lesson will only be running smoothly, if it is well planed taking into consideration all the factors (students' needs and abilities, core knowledge, prior knowledge e.t.c.) and nothing is left to chance.

The role of teachers in the differentiated teaching is vital, difficult and intensely differentiated. The teacher does not have the "leading role" with the image of someone who knows everything and is in charge of everything. In differentiated teaching teacher is "silently" the person in charge. He is the one to draw the main lines of the learning process leaving the students plenty of time and space for development and growth according to their personal characteristics and needs together with differentiated support received by their teacher. As Koutselini supports (2006), differentiation is what and how students work, something that is orchestrated with mastery, knowledge, experience, interest and love from each teacher for his students.

The creation of supporting differentiated educational material is also important in order to strengthen and facilitate the planning and application of differentiation, which is a time-consuming process. Resnik (1996), through his research with trainee teachers that applied differentiated teaching, reports the lack of materials (activities, books, work, medium), the lack of time for the necessary planning of work and finally the unsatisfactory support of their effort from the educational institutions and formal educational structures as the most important problems of the application of differentiation. Even though Resnik's research concerned students with special needs, the same problems are also reported in plenty of case studies in regular classrooms. Teaching based on the interests and the level of readiness of students is a demanding and time-consuming process, as it is expected by the teachers to create additional educational material. Teachers spend a great deal of time developing material for new differentiate activities, while they are deprived of time and opportunities for communication with other colleagues in order to discuss and reflected on their work (Leader, et. at., 1994). Furthermore the trial of new material is very difficult in the narrow time frames of school life (Leader, et. at., 1994).

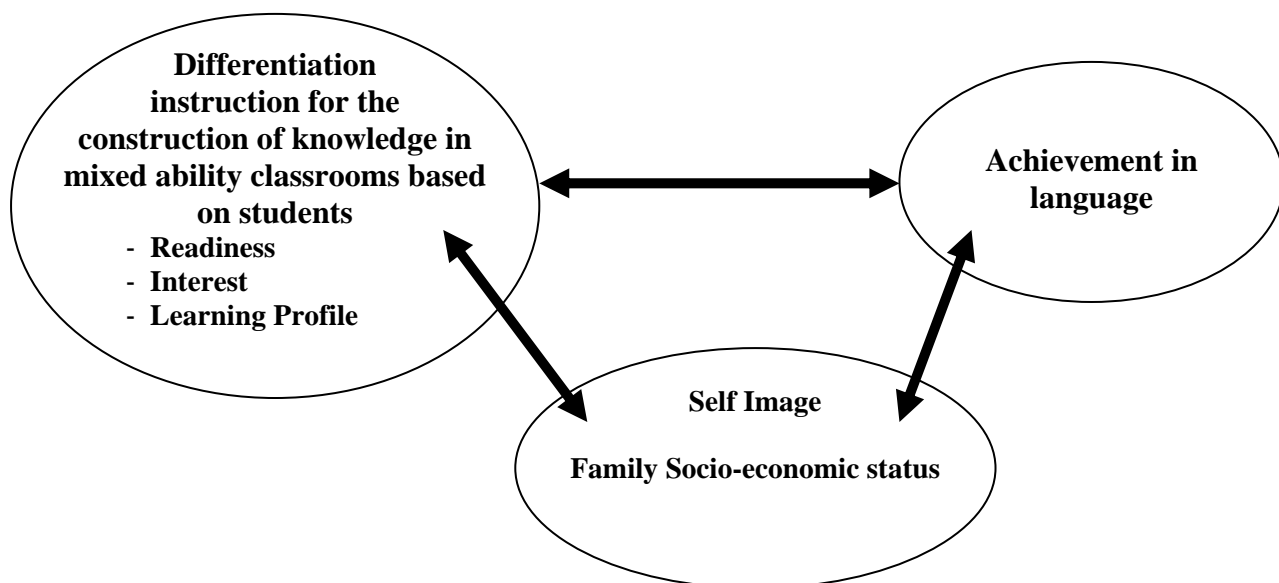
Theoretical Framework of the Research

Based on the theory of differentiation as presented through education literature, there is a great need for a research on the practice and the effectiveness of differentiation. Literature review has little to offer regarding differentiation, as it is mainly reporting on theories and practices on which differentiation practice is based on and refers only to a small number of studies (small scale – talented or unprivileged students) that support the event of effective teaching and learning through

differentiation (Tomlinson, 1999; Good and Brophy, 2003). Lack of evidence of the effectiveness of differentiation in mixed ability classrooms in combination with lack of evidence through empirical research concerning the techniques and practices of differentiation provides us with a basic framework of a full scale empirical research. A research that will provide the education world with substantial information on effective practices on differentiating teaching in mixed ability classrooms and at the same time investigate the effectiveness of differentiation on students on the whole and on specific group of students is an essence.

Based on the idea that differentiation can confront both, the chain reactions by increased diversity in mixed ability classes and the continuation of the phenomenon of school failure (Valiande & Koutselini, 2008) we believe that a research investigating differentiation instruction in mixed ability classrooms might help answer some critical questions on differentiation and the dark road to effective practises.

The basic theoretical framework of the research is present in the diagram (diag. 4).



Based on the theoretical framework of the research (Diagram 4), differentiation of teaching that leads students in mixed ability classrooms to construction of knowledge must take into consideration particular characteristics of students: readiness, interesting, training profile, socio-economic level and self-image of student, that effect learning positively or negatively and consequently effect both differentiation's final result and the academic achievement of students.

Readiness, interests, learning style, family socio-economic status and self-concept of student should shape and determine the differentiation instruction. The relationship between differentiated instruction and the factors that determine and form it are interrelated. In this sense it is believed that differentiated instruction can lead to a change in student's readiness level and the level of his self-concept and at the same time it is able to compensate the inferiority fillings of students from families with low socio-economic status.

The main aim of the research is the application of Differentiation Instruction (DI) in mixed ability classrooms and the evaluation of the effect of this application on academic achievement, on the development of competences and the self-image of students.

Furthermore the research will try and answer the main research questions:

- Is there a correlation between academic achievement and differentiated teaching?
- Is there a correlation between differentiated teaching and students' self esteem?

- Can DI act positively simultaneously for students from different family backgrounds?
- In what degree issues of self-image and family background together with DI improve academic achievement?

The significance and importance of this research can be found in the way that its results can facilitate and guide future educational and political decisions on formulating instructional approaches that are effective in modern mixed ability and multicultural classrooms.

Methodology of the research

The proposed research takes place this academic year (2008-2009). There are 450 4th grade elementary students and 24 teachers taking part in this research from Nicosia Educational District. Fourteen volunteer elementary teachers teaching in the fourth grade of Elementary school started training on the theory and practice of DI from the previous academic year. The researcher in cooperation with the Professor was responsible for the training of the participant teachers. The participant teachers continued to receive training and support all through the research in order to use DI in their classrooms. The mixed ability classrooms receiving differentiation language instruction constituted the experimental group. Another 10 teachers and their classrooms participated in the experimental research as the control group (10 classes). The teachers of the control group did not receive any training or support on differentiation throughout the research and did not differentiate their instruction in any way.

The researcher prepared material for the experimental group in cooperation with the volunteer teachers and observed systematically their teaching by using a likert scale questionnaire on DI. The questionnaire was developed by the researcher and its statements-questions were about the basic characteristics of effective differentiation instruction. Immediate feedback was given to the teachers by the researcher and a discussion followed the observed lesson in order to help the development of teachers in differentiating their instruction. Furthermore an online forum was created that gave the opportunity for teachers to exchange ideas and share their thoughts with the whole team of teachers participating in the research. The researcher was able through the forum and his personal email to address all the problems and the questions of the teachers.

Student's academic achievement was tested with two different tests they took prior to the research beginning of October 2008 and two tests taken at the end of the research end of May 2009. The same tests were taken by the students of the control group. Data was collected regarding the socioeconomical status of the students and other family factors that may influence the academic achievement of students by a questionnaire filled in by the students.

Data regarding the self-image of students was collected by the use of Harter's Self-Perception Profile for Children (SPPC) (1985). The SPPC is a multidimensional self-report instrument assessing perceived competence in children by using a 36 item self-report scale that consists of five specific sub-scales (scholastic competence, social acceptance, athletic competence, physical appearance, behavioural conduct) and one global measure of self-worth. Each sub-scale is measured by six items. Harter's questionnaire was given to students of both groups (experimental – control group) at the beginning and at the end of the research targeting to examine if self-image of students is affected by differentiated instruction and in what degree.

More data was collected by the semi-constructed interviews taken from the teachers and numerous students from the experimental group. The interviews investigated mainly the attitudes and perceptions of students and teachers over differentiation instruction and gave them the chance to

express them selves freely on practices they liked and enjoyed; on difficulties, qualities and on the benefits they gained from the experience of differentiation instruction over the school year.

The analysis of data due to the nature of the data collected (more than one level, level student, teacher, team, asynchronous data: pre- and pos-test) will be contacted by the use of multilevel analysis. The model of multilevel analysis of data it is used to a large extent in the analysis of data in research of educational effectiveness, since it offers a wider field of data analysis (Kyriakides and Charalambous, 2005).

Research data as mentioned above, were collected by quantitative research methods of collection of data (test - questionnaires) and qualitative research methods of collection of data (observation - interviews). The purpose and objective of using a combination of the two alter data collection methods is the advantages gain by analysing, evaluating and supporting the outcomes of the research by triangulation. Triangulation of data offers a more solid support for the research's conclusions (Cohen, D., Manion, L., and Morrison, K., (2000).

First outcomes from the research

The data collection has been completed this month (June 2009) and analysis of data will start immediately in order to investigate and answer the main research questions. Although data analysis is not yet completed on quantitative data some outcomes mainly on qualitative data are exported. Below we present some of the first outcomes of the research on differentiated instruction in mixed ability classrooms.

Teachers participated in the research reported that although they heard a lot about differentiation non of them didn't really knew how to practise differentiation instruction and most them had serious misconception on what is differentiation instruction. Almost none of the teachers practise differentiation instruction in their classrooms and none of them received a substantial training on differentiation, although differentiation instruction is one of the main teaching approaches in the Cyprus curriculum. Teachers cherish differentiation instruction as an effective teaching approach but none of them differentiate their teaching. Some of the teachers that reported to have use differentiation in the past did not really differentiate their instruction but had the misconception they did so by using different teaching methods, different materials and different activities.

Through the research we confirm some of the main presuppositions in bringing a change in education which is to motivate the teachers, to train them, to cooperate closely with them and offer them practical help (feedback and education material). Volunteer teachers participated in the research were very enthusiastic and willing to bring a change in their way of teaching in order to overcome some serious difficulties in teaching in mixed ability classrooms. There enthusiasm was shattered by their conservatism and their fears in changing routines they have been using over the years. They also seemed to fear losing control and failing to fulfil their teaching aims. With time and as the training went on they realise that the proposed differentiated instruction was a viable teaching proposition and not another education trend. From the minute they realize what differentiation really was and how they could put it into practise, their attitude changed and most of them took some small steps that lead them to a full scale differentiation. The image of students actively engage in the learning process, where everybody has its place, is not an image we can come across every day. In the case of differentiation this was the predominance image.

Final Word and expectations from the research

At the end of the experimental research we are really happy that we are able to follow through all the research procedures as planned and excluding the hard work, the tight schedule in preparing materials and meeting with all the participants, no real problems occur. We are optimistic that the research analysis will provide us with substantial and accountable results and information regarding our research questions. Finally it is important that the information gathered by this research will guide future research attempts.

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