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Conceptual Dimensions of Pedagogical Differentiation in School Education

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Abstract

The purpose of this paper is to analyze the conceptual content of pedagogical differentiation in school education, as it emerges from the descriptions and discussion of authors, researchers and experts through content analysis of 22 publications in the Greek and international literature in various scientific texts, books, journal articles and conferences. From the analysis that was performed, twelve dimensions or otherwise characteristics of pedagogical differentiation emerged that presented the highest frequency of occurrence and were included in four broad categories that are: a. "processes", b. "context", c. "the learning outcomes" and d. "assessment". The results of the research show that in secondary education the dimension with the highest frequency is the modification of the supportive learning context, followed by meeting the needs of the students and the continuous improvement of the learning for all students. From the publications studied on pedagogical differentiation, which referred to primary and secondary education together, it appears that the most frequent dimensions are the modification of the supportive learning context and meeting the needs of the students. Dimensions with the lowest frequency of occurrence in secondary education include the possibility of learning option / multiple options, the development of procedural knowledge skills and continuous assessment, while in the publications for primary and secondary education together, the dimensions of development of life skills and continuous assessment were not identified.

Keywords

pedagogical differentiation, dimensions of pedagogical differentiation, secondary education, primary education

1. Introduction

The modern educational system, due to migration flows and the widening of social and economic inequalities, is called upon to face the ever-increasing diversity of students (Manolakos, 2012). Students' differences in knowledge, skills and abilities can marginalize less able students, intensifying their frustration and leading them to isolation from classmates and teachers, which if not addressed immediately can lead to dropout and subsequent school failure (Kanakis, 2007).

An innovative teaching practice, which can contribute to the effective treatment of different educational needs and to halting school failure is pedagogical differentiation (Valiandes & Neophytou, 2017). The intense research interest that has been developed in the Greek and in the international field reflects its special contribution to the improvement of the educational process. However, researchers' views on the precise definition and adoption of a commonly accepted definition of pedagogical differentiation in secondary education and in primary and secondary education together are not completely identical. In their studies, various definitions of pedagogical differentiation are recorded, which describe its individual characteristics or dimensions, reflecting their different approaches.

Indicatively, Butt and Kausar (2010, p. 107) consider that pedagogical differentiation is "an approach that concerns the design of teaching, so that a lesson can be taught throughout the classroom, while at the same time meeting the individual needs of each student." According to Padeliadu (2013, pp. 159-160) pedagogical differentiation is recorded "as a different pedagogical approach to teaching and learning which focuses on changing teaching methods and learning methods, aiming at the learning of all students, depending on the level skills, interests and how to learn them".

Furthermore, Valiandes and Neophytou (2017, p. 24) note that pedagogical differentiation is "the teacher's effort to respond to the diversity of students in a class by adapting the curriculum (content), encouraging critical thinking (process) and providing a variety of opportunities to students, to demonstrate and prove what they have learned (product)"

The purpose of this paper is to analyze the conceptual content of the term pedagogical differentiation in secondary education but also in primary and secondary education together, through the study of material from scientific texts, books and articles in scientific journals and conferences, in order to determine the characteristics or otherwise the elements that constitute the term pedagogical differentiation in that level of education. Initially, a conceptual map of the definition was designed and at the conclusion, a table of twelve dimensions of pedagogical differentiation related to the processes, the context, the learning outcomes and the assessment was produced.

2. Methodology

A literature review was conducted in order to develop a list of those important components that various researchers, experts and authors use to define the concept of pedagogical differentiation in primary and secondary education, as well as in primary and secondary education together. The method used was similar to that of Frey, Schmitt and Allen (2012), who presented a conceptual analysis for authentic

evaluation. Pedagogical differentiation was examined in specific subjects of secondary education (Hogan, 2014; Pablico, Diack, & Lawson, 2017; Argyropoulou, 2018) and primary and secondary education together (Danzi, Reul, & Smith, 2008; Smit & Humpert, 2012; Tatsiota & Griva, 2018).

Twenty-two publications have been found in journals articles, conferences, books and various scientific papers, in which various authors have defined pedagogical differentiation by giving various characteristics of it or by providing an unchanged definition of the process of pedagogical differentiation through which these characteristics emerge. Then, the publications were grouped based on the level of education (secondary education, primary and secondary education together) and 17 publications were collected for the secondary and 5 for the primary and secondary education together.

The aim was, through content analysis, to examine the concept of pedagogical differentiation through the descriptions and discussion of authors, researchers and experts.

3. Process of Determining the Dimensions of Pedagogical Differentiation

Determining the dimensions of pedagogical differentiation is subject to the subjective judgment of the researchers. Below there are some examples regarding the identification of some of these dimensions as they emerged from the original texts of the publications that were collected and examined.

"… the implementation of different methods, teaching aids and teaching rhythm for different students" (Koutselini & Agathangelou, 2009, p. 1).

"… a teaching philosophy based on the idea that teachers should adapt instruction to student differences … modify their instruction to meet the students' varying readiness levels, interests and learning preferences" (Butt & Kausar, 2010, p. 107).

The above were classified in the Modification of supportive learning context dimension.

Below are some examples of phrases related to the definition of pedagogical differentiation which were classified in the dimension Meeting the needs of the students.

"… an approach that enables teachers to plan strategically to meet the needs of every student…" (Smit & Humper, 2012, p. 1153).

"… Adaptation of the teaching process in order to meet the different and special needs of students…" (Tatsioka & Griva, 2018, p. 156).

The following three examples are given below for the Continuous improvement of learning for all students dimension.

"… It is a proactive approach to improve learning for all students" (Danzi, Reul, & Smith, 2008, p. 37).

" Differentiated instruction's core belief is that all students can learn…" (Graham, 2009, p. 3).

"… a comprehensive approach to teaching. It is an organized, yet flexible way of proactively adjusting teaching and learning to meet kids where they are ..." (King, 2010, p. 2).

For the dimension of Student-centered teaching and learning, the following examples are given.

"… An approach to planning, so that one lesson may be taught to the entire class…" (Butt & Kausar, 2010, p. 107).

"…is student focused rather than teacher focused …" (Westbrook, 2011, p. 9).

In addition, there are three examples for the Flexible learning context / Flexible grouping dimension.

"… allows students to work at different speeds and abilities" (Danzi, Reul, & Smith, 2008, pp. 37-38).

"… the flexibility of space as well as the flexible grouping of students" (Lagadinou, 2014, p. 14).

"A conscious teaching method, which provides many alternative learning pathways" (Tatsioka & Griva, 2018, p. 156).

Subsequently, for the dimension of the Possibility of learning option / multiple options, the following examples are given.

"… by providing students with multiple options for learning …" (Patterson, Connolly, & Ritter, 2009, p. 46).

"… a teaching theory that vary in content" (Robinson, Maldonado & Whaley, 2014: 3).

For the dimension Success and active participation of the student in his learning, the following three examples are presented.

"… allowing each student to make his or her own meaning from what is being taught in their own way…" (Patterson, Connolly, & Ritter, 2009, p. 46).

"… teachers actively work to meet students where they are academically and then challenge each student accordingly, so that academic growth will occur " (Smith, 2011, p. 16).

"… to maximize the individual success and growth of each student in the classroom" (Ariss, 2017, P. 10).

Moreover, for the dimension Development of life skills the tow following examples are provided.

"… all students can learn in a comfortable, safe learning environment…" (Graham, 2009, p. 3).

"… An educational orientation that seeks to meet individual student readiness, interests and learning profiles through a teacher-created educational environment …" (Wenzel, 2017, p. 21).

Below, two examples for the dimension Development of procedural knowledge skills are presented.

"… to maximize each student's growth … assisting in the learning process" (Stone, 2012, p. 136).

"… their instruction respond to learner needs in the way content is presented" (Dixon, Yssel, McConnel. & Hardin, 2014, p. 113).

"… a teaching theory that …vary… in presentation…" (Robinson, Maldonado, & Whaley, 2014, p. 3).

The following examples are given for the dimension Modification of learning "products".

"…allowing each student … to individually express what he or she has learned…" (Patterson, Connolly, & Ritter, 2009, p. 46).

"… "… teachers proactively modify… student "products"…" (Kiley, 2011, p. 18).

Furthermore, for the Alternative / modern forms of assessment dimension, the following examples are given.

"… the process teachers use to improve learning by tailoring instruction and assessment to learners' individual needs…" (Hogan, 2014, p. 10).

“ Teaching theory that … vary… in … assessment, and meet the needs of all learners in the classroom” (Robinson, Maldonado, & Whaley, 2014, p. 3).

Finally, for the Continuous assessment dimension, the following example is presented.

«…. Continuous assessment is considered an essential component…”(Lagadinou, 2014, p. 14).

In the early stages of the literature review, a conceptual map was created in which the key elements of pedagogical differentiation from each publication were noted. This helped to create labels for the number of items that were found. Common or similar elements of the definitions were entered in the same column, and as the study of the material was in progress and other elements emerged, the original categories were revised to include these new elements. This means that many similar elements have been combined in order to have a category, as the goal was to create as few categories as possible. In the end, twelve dimensions of pedagogical differentiation emerged and for each dimension it was presented the frequency of its occurrence, specifically calculating the relative frequency, in order to underline the significance of each element.

Figure 1 presents the conceptual map that shows the initial pilot identification of elements of pedagogical differentiation in secondary education but also in primary and secondary education together, related to processes, context, learning outcomes and assessment.

		Processes	Context	Learning outcomes	Assessment
SECONDARY EDUCATION	Grafi-Sharabi, 2009	Responding to the diverse needs of students in terms of their learning style, interest and capabilities	Flexibility in content		Product flexibility
	Patterson, Connolly & Ratter, 2009	Teachers' response to the needs of each student	Provided by teachers with multiple learning options	Acquisition of knowledge by each student in his own way	Each student expresses individually what he has learned
	Langley, 2015	Content differentiation	Promoting success		Learning product
	Pablico, Diack &Lawson, 2017	Different ways to present content	A teaching philosophy		Different ways of assessment
PRIMARY & SECONDARY EDUCATION	Robinson, Maldonado & Whaley, 2014	Satisfaction of individual needs of all students	Variety of content	Variety of presentation	Variety of assessment
	Tatsioka&Griva, 2018	Content modification	Providing alternative ways of learning		Product modification

Figure 1. Initial Pilot Identification of Elements of Pedagogical Differentiation

4. Results

The dimensions of pedagogical differentiation that were most reported in the publications were grouped into the following four categories:

a) Processes

- Modification of the supportive learning context
- Meeting the needs of the students
- Continuous improvement of the learning for all students

b) Context

- Student-centered teaching and learning
- Flexible learning context/ flexible grouping
- Possibility of learning option / multiple options

c) Learning outcomes

- Success and active participation of the student in his learning
- Development of life skills
- Development of procedural knowledge skills

d) Assessment

- Modification of learning "products"
- Alternative / modern forms of assessment
- Continuous assessment

Table 1 contains the publications that were studied pedagogical differentiation in secondary education. Table 2 contains the publications that were explored pedagogical differentiation in primary and secondary education together. For any scientific text, article, or book in which a dimension of pedagogical differentiation was part of the definition as it was presented in the publication, the cell associated with that dimension was shaded. Furthermore, the following tables record the percentages that show the frequency of occurrence of each dimension of pedagogical differentiation.

Table 1. The Dimensions of Pedagogical Differentiation in Secondary Education

Categories		Processes			Context			Learning outcomes			Assessment		
Dimensions of pedagogical differentiation		Modification of the supportive learning context	Meeting the needs of the students	Continuous improvement of the learning for all the students	Student-centered teaching and learning	Flexible learning context/flexible grouping	Possibility of learning option/multiple options	Success and active participation of the student in his learning	Development of lifeskills	Development of procedural knowledge skills	Modification of learning "products"	Alternative/modern forms of assessment	Continuous assessment
s/n	Percentage of occurrence of each	76,4 %	47%	47%	35,3 %	17,6 %	5,8%	29,4 %	17,6 %	5,8%	35,3 %	17,6 %	5,8%

	dimension												
1	Grafi-Sharabi, 2009	■				■						■	
2	Graham,2009		■	■				■	■				
3	Koutselini& Agathangelou, 2009	■		■									
4	Patterson, Connolly & Ritter,2009		■				■	■			■		
5	Butt&Kausar, 2010	■	■		■								
6	King,2010	■	■	■					■				
7	Kiley, 2011	■	■	■							■		
8	Smith,2011	■		■	■			■					
9	Westbrook, 2011				■	■							
10	Stone,2012	■		■						■			
11	Hogan,2014	■		■								■	
12	Lagadinou, 2014	■	■	■	■	■					■		■
13	Langley,2015	■						■			■		
14	Ariss,2017	■						■			■		
15	Pablico,Diack & Lawson, 2017	■			■							■	
16	Wenzel,2017	■	■						■		■		
17	Argyropoulou, 2018		■		■								

* The shaded are as indicate the presence of each element.

Table 2. The Dimensions of Pedagogical Differentiation in Primary and Secondary Education Together

Categories		Processes			Context				Learning outcomes			Assessment		
Dimensions of pedagogical differentiation		Modification of the supportive learning context	Meeting the needs of the students	Continuous improvement of the learning for all the students	Student-centered teaching and learning	Flexible learning context/flexible grouping	Possibility of learning option/multiple options	Success and active participation of the student in his learning	Development of lifeskills	Development of procedural knowledge skills	Modification of learning "products"	Alternative/modern forms of assessment	Continuous assessment
s/n	Percentage of occurrence of each dimension	80%	80%	40%	20%	40%	20%	20%		40%	40%	40%	
1	Danzi, Reul&Smith, 2008			■	■	■		■					
2	Smit&Humpert, 2012	■	■										
3	Dixon, Yssel, McConnel&Hardin, 2014	■	■							■	■	■	
4	Robinson, Maldonado & Whaley 2014	■	■	■			■			■		■	
5	Tatsioka & Griva, 2018	■	■			■					■		

* The shaded are as indicate the presence of each element.

5. Discussion

5.1 Dimensions of Pedagogical Differentiation in Secondary Education

In secondary education, from the 17 publications studied in the Greek and international literature, it appears that the dimensions with the highest frequency are the modification of the supportive learning context (76.4%), meeting the needs of students (47%) and continuous improvement of the learning for all students (47%) who are all three in the "processes" category.

This is followed by the modification of learning "products" (35.3%) which belongs to the category "assessment", the student-centered teaching and learning (35.3%) which belongs to the category "context", the success and active participation of the student in his learning (29.4%) and the development of life skills (17.6%) belonging to the category "learning outcomes", the flexible learning context / flexible grouping (17.6%) belonging to the category "context", the alternative / modern forms of assessment (17.6%) which belongs to the category "assessment", the possibility of learning option / multiple options (5.8%) which falls into the category "context", the development of procedural knowledge skills (5.8%) belonging to the category "learning outcomes" and finally the continuous assessment dimension (5.8%) which falls into the "assessment" category.

The dimension of modification of the supportive learning context in many publications is a key feature of pedagogical differentiation, as teachers respond to differences in the level of readiness, interest and learning profile of each student (King, 2010) by modifying curricula and available resources (Kiley, 2011).The appropriate material and technical infrastructure (Koutselini & Agathangelou, 2009; Smith, 2011) as well as the flexibility of space (Lagadinou, 2014) are considered essential elements for the successful implementation of pedagogical differentiation. This dimension also includes, according to some researchers, an organized and flexible way of actively adapting teaching and learning (King, 2010) to address classroom diversity (Wenzel, 2017). Indicatively, Pablico, Diack, and Lawson (2017) note that there are different ways to present the content and process based on the readiness, interest and learning profile of students, while Lagadinou (2014) that is the planning accordingly with the teaching style of each teacher and the needs of each student population. Furthermore, several researchers report that by modifying teaching methods and teaching activities (Kiley, 2011; Lagadinou, 2014; Langley, 2015; Wenzel, 2017), which focus on different forms of learning, interests, pace, skills and knowledge of different students (Koutselini & Agathangelou, 2009), teachers effectively deal with their diversity (Kiley, 2011; Stone, 2012; Wenzel, 2017) by adapting learning experiences to meet their individual needs (Langley, 2015) and contribute to the learning process based on the cognitive level of each student (Stone, 2012).

The dimension of meeting the needs of students seems to be an equally important feature of the definitions, as in many publications it is mentioned as an element of pedagogical differentiation. For example, Graham (2009) points out that pedagogical differentiation aims to meet the different needs of students. Also, other researchers report that teachers respond to the needs of each student (Patterson, Connolly, & Ritter, 2009), addressing individual learning needs based on their readiness, interests and

forms of learning (Wenzel, 2017). In addition, Argyropoulou (2018) points out that pedagogical differentiation is the satisfaction of the differences of the student population in the mixed ability classes.

The dimension of continuous improvement of the learning for all students is a dimension that is located to the same degree as the dimension of meeting the needs of the students in definitions or characteristics of pedagogical differentiation. For many researchers, the dimension of continuous improvement of the learning for all the students is a feature of pedagogical differentiation, as it improves student performance (Koutselini & Agathangelou, 2009; Hogan, 2014), maximizing their learning potential (Stone, 2012). Other scholars point to the achievement of progress (Hogan, 2014) and the maximization of learning opportunities of all students (Lagadinou, 2014).

The dimension of modification of learning "products" seems to be an equally important part of the definitions, albeit to a lesser extent than the previous three dimensions. Many researchers define it as a process in which students individually express what they have learned (Patterson, Connolly, & Ritter, 2009). Also, the flexibility of teachers in the "product" (Grafi-Sharabi, 2009) allows each student to express individually what he has learned (Patterson, Connolly, & Ritter, 2009).

Furthermore, to the same extent as the previous dimension, definitions of pedagogical differentiation are based on the dimension of student-centered teaching and learning. This dimension is mentioned by some researchers as a feature of pedagogical differentiation, as it is an innovative way of thinking about the teaching process and learning aimed at effective teaching (Lagadinou, 2014) and a teaching philosophy (Pablico, Diack, & Lawson, 2017) which reviews the traditional way of looking at the teaching-learning process (Argyropoulou, 2018). Some researchers refer to their definitions as a design approach (Butt & Kausar, 2010) and a collection of best practices (Smith, 2011) that focus on students (Westbrook, 2011). They also consider that the teaching of the whole class (Butt & Kausar, 2010) by the teachers, who approach the students focusing on their cognitive level, is effective (Smith, 2011).

The dimension of success and active participation of the student in his learning is located to a lesser extent compared to the previous dimensions. This dimension is a key feature of pedagogical differentiation according to several researchers, as it contributes to maximizing students' individual success (Ariss, 2017) and is considered essential for the acquisition of knowledge by every student who is dedicated and actively involved in the learning process (Graham, 2009) and acquires knowledge in its own way (Patterson, Connolly, & Ritter, 2009).

To an even lesser degree than the previous dimensions are the dimensions of development of life skills, flexible learning context / flexible grouping and alternative / modern forms of assessment, which are dimensions that are found to the same degree in definitions or characteristics of pedagogical differentiation. This first dimension is reflected by some researchers as an important feature of pedagogical differentiation, as it contributes to the successful integration of all students (King, 2010) by shaping an appropriate environment and climate in the classroom by the teacher (Graham, 2009; Wenzel, 2017). Regarding the second dimension, there are researchers who argue that the flexible

learning context is defined as a variety of options (Westbrook, 2011) and the possibility of flexible grouping of students (Lagadinou, 2014). It also allows teachers flexibility in content and process (Grafi-Sharabi, 2009). As for the third dimension, alternative / modern forms of assessment, there are some researchers who consider it an important feature of pedagogical differentiation, as teachers have the ability to apply different ways of presenting the assessment of learning outcomes based on readiness, interest and student learning profile (Ariss, 2017; Pablico, Diack, & Lawson, 2017). Also, some other researchers point out the importance of adapting the assessment by teachers to the individual needs of students (Kiley, 2011; Hogan, 2014; Lagadinou, 2014; Wenzel, 2017).

Finally, the dimensions of the possibility of learning option / multiple options, the development of procedural knowledge skills and continuous assessment are dimensions with the lowest frequency of occurrence and are also located to the same degree in definitions or characteristics of pedagogical differentiation. For the dimension of the possibility of learning option / multiple options, researchers report that it is the provision by teachers of multiple learning options to students (Patterson, Connolly & Ritter, 2009) based on their readiness, interest and learning profile (Ariss, 2017; Pablico, Diack, & Lawson, 2017), for the dimension of development of procedural knowledge skills point out that it contributes to the learning process based on the cognitive level of each student (Stone, 2012) and finally, for the continuous assessment that is necessary for the successful outcome of pedagogy of differentiation (Lagadinou, 2014).

5.2 Pedagogical Differentiation in Primary and Secondary Education Together

From the 5 publications studied in the Greek and international literature on pedagogical differentiation, which referred to primary and secondary education together, it appears that the dimensions with the highest frequency are the modification of the supportive learning context (80%) and the meeting the needs of the students (80%) falling into the “processes” category. The following are the dimensions: development of procedural knowledge skills (40%) which belongs to the category “learning outcomes”, the modification of “learning products” (40%) which falls into the category “assessment”, the continuous improvement of the learning for all the students (40 %) belonging to the category “processes”, the alternative / modern forms of assessment (40%) belonging to the category “assessment”, the flexible learning context / flexible grouping (40%) as well as the possibility of learning option / multiple options (20 %) belonging to the category “context”, the success and active participation of the student in his learning (20%) belonging to the category “learning outcomes” and student-centered teaching and learning (20%) belonging to the “context” category. The dimensions of the development of life skills belonging to the category of “learning outcomes” and continuous assessment falling under the category of “assessment”, which appear in the studies of primary and secondary education, were not identified in these surveys that examined them in combination.

The dimensions of modification of the supportive learning context and meeting the needs of the students are the most basic dimensions of pedagogical differentiation, as they were recorded in most of the definitions from the examined researches. More specifically, the dimension of modification of the

supportive learning context is an important feature of pedagogical differentiation as it aims to adapt teaching to different levels of students (Smit & Humpert, 2012). It is defined as a deliberate and conscious method of planning and teaching that provides multiple learning possibilities (Robinson, Maldonado, & Whaley, 2014), as a modification of content, process and learning environment (Dixon, Yssel, McConnel, & Hardin, 2014; Tatsioka & Griva, 2018) and is related to learning tools (Robinson, Maldonado, & Whaley, 2014).

The dimension of meeting the needs of the students is reflected by most researchers as an important feature of pedagogical differentiation. Indicatively, Smit and Humpert (2012) and Robinson, Maldonado, and Whaley (2014) consider it to be the meeting of the individual needs of all students and Tatsioka and Griva (2018) refer to it as a response to the different and special needs of students in heterogeneous classes.

Dimensions of development of procedural knowledge skills, modification of learning "products", continuous improvement of the learning for all students, alternative / modern forms of assessment and flexible learning context / flexible grouping are mentioned by a smaller number of researchers as features of pedagogical differentiation. The dimension of development of procedural knowledge skills is defined as the way in which content is learned (Dixon, Yssel, McConnel, & Hardin, 2014; Tatsioka & Griva, 2018) and as a variety of presentation (Robinson, Maldonado & Whaley, 2014).Modification of learning "products" is related to the ways in which students respond to the content of learning (Dixon, Yssel, McConnel, & Hardin, 2014; Tatsioka & Griva, 2018). Continuous improvement of the learning for all students aims to achieve the same academic goal by all students (Robinson, Maldonado & Whaley, 2014) and contributes to the improvement of their learning (Danzi, Reul, & Smith, 2008). Alternative / modern forms of assessment are mentioned by researchers as features of pedagogical differentiation. Indicatively, Dixon, Yssel, McConnel, and Hardin (2014) point out the flexibility of teachers, who recognize the different knowledge, readiness, interests and preferences of students and apply a variety of assessment (Robinson, Maldonado, & Whaley, 2014). The flexible learning context / flexible grouping is defined as the provision of many alternative learning pathways (Tatsioka & Griva, 2018), as the work of students with different speeds and abilities (Danzi, Reul, & Smith, 2008) and is related to learning styles (Danzi, Reul, & Smith, 2008).

The dimensions of possibility of learning option / multiple options, success and active participation of the student in his learning and student-centered teaching and learning are also, for an even smaller number of researchers, features of pedagogical differentiation. The possibility of learning option / multiple options refers to the variety of content (Robinson, Maldonado, & Whaley, 2014), the success and active participation of the student in his learning is a feature of pedagogical differentiation as it contributes to the success of all students (Danzi, Reul, & Smith, 2008) and student-centered teaching and learning is defined as teaching design for different levels of student competence (Danzi, Reul, & Smith, 2008).

Finally, the dimensions of the development of life skills and continuous assessment were not identified

in the research that examined the combined pedagogical differentiation in primary and secondary education.

6. Conclusions

The present research focused on the conceptual analysis of pedagogical differentiation in school education by gathering and examining elements of its definition in books, scientific texts and articles in journals and conferences.

Through this analysis, twelve dimensions of pedagogical differentiation were found, which in turn were grouped into three in a broader category. Specifically, modification of the supportive learning context, meeting the needs of the students, and the continuous improvement of the learning for all students were included in the category "processes". Student-centered teaching and learning, the flexible learning context/ flexible grouping and the possibility of learning option / multiple options were included in the "context" category. The success and active participation of the student in his learning, the development of life skills and the development of procedural knowledge skills were included in the category" learning outcomes". Finally, the modification of learning "products", the alternative / modern forms of assessment and the continuous assessment were included in the category "assessment".

In secondary education, the results of the research showed that in the category "processes" the dimension of the modification of the supportive learning context was presented more often, in the category "context" the dimension of student-centered teaching and learning, in the category "learning outcomes" the success and active participation of the student in his learning and in the category "assessment" the dimension modification of learning "products".

The modification of the supportive learning context is the most basic dimension of pedagogical differentiation in secondary education and appears to a much greater extent compared to its other dimensions, as this teaching approach responds to differences in the level of readiness, interest and learning profile of each student, modification of curricula and resources available by teachers. It is an organized and flexible way of actively adapting teaching and learning to deal with diversity in the classroom.

The dimensions of meeting the needs of students and continuous improvement of the learning for all students appear to a lesser but significant degree compared to the previous dimension. The first aims to meet the different needs of students and the second improves student performance, maximizing their learning ability.

The dimension of modification of learning "products" is presented to a lesser extent than the previous two dimensions and is another feature of pedagogical differentiation, as it is a process in which students express separately what they have learned.

The dimension of student-centered teaching and learning appears to the same extent as the previous one and is an innovative way of thinking about the teaching process and learning that aims at effective teaching by reviewing the traditional way of looking at the teaching-learning process and focusing on

students.

The dimension of success and active participation of the student in his learning appears to a lesser extent than the previous dimension and is a feature of pedagogical differentiation, as this teaching approach contributes to maximizing the individual success of students and is considered essential for the acquisition of knowledge by each student, who is dedicated and actively participates in the learning process and acquires knowledge in his own way.

The dimensions of the development of life skills, flexible learning context / flexible grouping and alternative / modern forms of assessment are presented to a lesser extent compared to the previous dimension. The first contributes to the successful integration of all students by shaping an appropriate environment and climate in the classroom by the teacher, while the second is related to the variety of options and the possibility of flexible grouping of students. The third dimension is characteristic of pedagogical differentiation, as teachers have the ability to apply different ways to present the assessment of learning outcomes based on the readiness, interest and learning profile of students.

The dimensions of possibility of learning option / multiple options, development of procedural knowledge skills and continuous assessment have an extremely small presence in the definitions of pedagogical differentiation. The first dimension is related to the provision by teachers of multiple learning options to students based on their readiness, interest and learning profile. The second contributes to the learning process based on the cognitive level of each student and finally, the third is necessary for the successful outcome of pedagogical differentiation.

From the studies that were implemented in combination in primary and secondary education in the category “processes” the dimension of modification of the supportive learning context was identified more often, in the category “context” the dimension of flexible learning context / flexible grouping, in the category “learning outcomes” the development of procedural skills knowledge and in the category “assessment” the modification of learning “products”. The dimensions of development of procedural knowledge skills which belongs to the category of “learning outcomes” and continuous assessment falling under the category of “assessment” which appeared in the studies of secondary education, were not identified in these surveys that examined them together.

The dimensions of the modification of the supportive learning context and meeting the needs of students are the most basic dimensions of pedagogical differentiation. The dimension modification of the supportive learning context is an important feature of pedagogical differentiation as it aims to adapt teaching to different levels of students and is a deliberate and conscious method of planning and teaching that provides multiple possibilities. Meeting the needs of the students is related to teachers’ response to the different and special needs of students in heterogeneous classrooms.

The dimensions of development of procedural knowledge skills, modification of learning “products”, continuous improvement of the learning for all students, alternative / modern forms of assessment and flexible learning context / flexible grouping appear to a lesser extent compared to the previous two dimensions in the definitions of pedagogical differentiation. The first dimension is related to the way

the content is learned and the variety of its presentation. The second is related to the ways in which students respond to the content, while the third aims at achieving the same academic goal by all students and contributes to the improvement of their learning. The fourth is related to the flexibility of teachers, who recognize the different knowledge, readiness, interests and preferences of students and apply a variety of assessment and the fifth provides many alternative learning paths, student work with different speeds and skills and is related to forms of learning.

The dimensions of possibility of learning option / multiple options, success and active participation of the student in his learning and student-centered teaching and learning have an extremely small presence in the definitions of pedagogical differentiation. The first refers to the variety of content, the second to the success of all students and the third to the design of teaching for different levels of students' abilities.

Finally, the dimensions of development of life skills and continuous assessment were not identified in the primary and secondary education surveys that examined them together.

It follows from the above conclusions that the twelve dimensions of pedagogical differentiation were identified to varying degrees in the various studies. Therefore, more research is needed in order to formulate a more limited conceptual content of pedagogical differentiation and a more complete presentation of its dimensions in both primary and secondary education.

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