

The Effect of lesson Study on the Way Teachers Understand What Is and What Is not Differentiation in Teaching: Results of Pilot Research in Secondary Schools in Greece

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Abstract

The main purpose of this paper is to present the results of a research that aimed to investigate the effect of lesson study on the way in which teachers understand what is and what is not differentiation in the teaching of Modern Greek Language course of the 2nd Lyceum class. The research was qualitative, data collection and analysis techniques of grounded theory were used and was carried out from 09-22-2022 to 11-28-2022, in three schools in Eastern Attica, with the participation of four teachers and eighty students in a lesson study cycle. Data collection tools were interviews of participating teachers before, during, and after the implementation of the lesson study. From the results of the research emerged that before the implementation of the lesson study teachers were unable to answer clearly and completely what makes a task/activity or lesson differentiated, to determine which students will work with which assignments as well as to give a complete definition of differentiation. After applying the lesson study, they gained new knowledge about differentiation techniques and strategies and most gave a more complete definition of it. They all identified the elements of differentiation that were evident in the lesson designed by the team and felt that their participation in the lesson study contributed to the understanding of differentiation. They also responded better to students' needs by clarifying their misconceptions about differentiation and getting a more complete picture of what is and is not differentiation expressing their concern regarding their aspirations and performance in their own differentiation efforts.

Keywords: lesson study, differentiated instruction, research lesson, secondary education

1. Introduction

In the increasingly heterogeneous classrooms of the Greek educational system, teachers must teach effectively by revising perception and teaching methods (Sfyroera, 2004), in order to be able to meet the diverse needs of students by successfully addressing their diversity (Tomlinson, 2003). The enrichment of teachers' knowledge and their professional development contribute decisively to improving the quality of teaching (Harsono, 2016). Therefore, they must implement the most appropriate teaching practices, enabling all students to meet their learning needs by maximizing their potential.

The implementation of two teaching practices, lesson study and differentiated instruction, can improve students' learning and teachers' professional development (De Jesus, 2012). Through collaborative learning, which is promoted by the implementation of lesson study and differentiated instruction, it can be successfully addressed to the increasing school diversity and new social data and demands which cannot be implemented with traditional teaching methods (Fykaris & Mitsi, 2012). More specifically, through the interaction between teachers and students, synergies are created that make the educational process more effective (Bandura, 2006). When teachers work together as part of a common collective effort, they improve teaching and learning, benefiting themselves and their students (Van Sickle, 2011).

Their collaboration focuses on the student by improving their teaching and promoting their professional development, making schools learning spaces for teachers and students (Desimone, 2009). This process guided by the teachers themselves and not by various external experts who visit their classrooms to teach methods, which may not be able to be effectively applied to all students (Birman, Desimone, Porter & Garet, 2000).

From the review of the international literature, only two studies were identified which examine the effect of lesson study in the context of the implementation of differentiated instruction in Mathematics in primary education (Harsono, 2016; Hockett, 2010). From the review of the Greek literature, no research was found that studies the effectiveness of lesson study in the context of the implementation of differentiated instruction. More specifically, most of the research in the international and Greek literature on lesson study was mainly concerned with the professional development of teachers and the improvement of student learning in minimal academic subjects (Howell, 2014; Loose, 2014; Panoutsos, 2015; Sirotic, 2015), while a lot of research on differentiated instruction focused mainly on the conditions, procedures and difficulties for its effective implementation as well as its effect on student learning (Hogan, 2014; Maddox, 2015; Stone, 2012).

From the review of the research, it follows: a. a relatively small number of research on the implementation of lesson study and differentiated instruction in secondary education as well as on the evaluation of their effectiveness on the learning outcomes of students in the Modern Greek Language course in Greece b. a small number of research focusing on the conditions, processes and difficulties of lesson study and effective differentiation in the Modern Greek language course and c. lack of experimental research to evaluate the effectiveness of lesson study in the context of the implementation of differentiated instruction in Greece and internationally. The present research is implemented aiming to cover these gaps. More

specifically, it aims to investigate the effect of lesson study on the way the teacher plans, implements and understands differentiated instruction in secondary education in the Modern Greek Language course of the 2nd Lyceum, a cognitive field in which students often face particular learning difficulties, which make it difficult for them to achieve their learning goals.

2. Lesson Study and Differentiated Instruction: Theoretical Approach

2.1. Lesson Study

Lesson study is a didactic approach which is based on the collaboration between teachers, directed by them, carried out in the classroom focusing simultaneously on the improvement of their teaching and the learning of their students (Hamzeh, 2014)

In the context of lesson study, differentiated instruction can be directly studied by observing the effect of research lesson design and certain elements of instruction on students' motivation, discovery, dialogue, and acquisition of knowledge. Fruitful dialogue between teachers facilitates understanding and improvement of teaching, actively engages teachers to explore, observe and revise their teaching, promotes their professional development, which is directly linked to their teaching in their own classroom. Therefore, teachers' professional development is implemented by themselves, learning through their daily teaching (Nauerth, 2015).

The lesson study is implemented by a small group of teachers of the same specialty, usually 3 to 6 people, who, devoting approximately 10 to 15 hours over a period of 3 to 4 weeks, collaboratively plan and implement the teaching of a teaching unit (Fernandez, 2002; Hockett, 2010).

The views of the researchers differ on defining the stages of the lesson study process (Coe, 2010), the number of which ranges from four (Lewis, 2002) to eight stages (Stigler & Hiebert, 1999). The present research, according to the opinions of most researchers, distinguishes the lesson study in the following stages (Stepanek et al., 2007):

- I. Research theme, choose a unit and setting learning goals
- II. Planning the research lesson
- III. Teaching, observing and collecting data of the research lesson
- IV. Assessment – feedback, revising and reteaching.
- V. Reflecting - formulating and sharing final results.

Figure 1 shows a lesson study cycle.

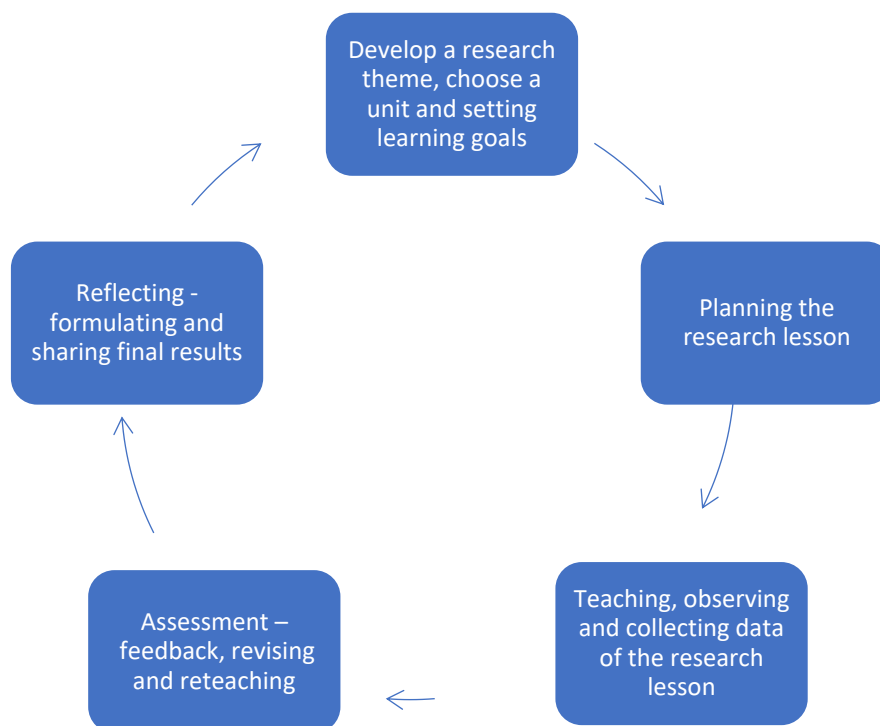


Figure 1. Presentation of a Lesson Study Cycle (Adapted from Stepanek et al., 2007).

2.2 Differentiated Instruction

Differentiated instruction is a didactic approach to alleviate inequalities between students and improve their performance, offering the possibility for the teacher to intervene in important axes of the learning process, to facilitate the participation of all students in learning (Argyropoulos, 2013). Differentiated instruction is based on two important axes, the student and the curriculum (Padeliadu, 2008). The first axis, focusing on the special needs of students, is distinguished in learning readiness, interests and learning profile (Tomlinson, 2001). Knowing these parameters in depth, the teacher can obtain important information to plan and organize his/her teaching effectively (Valiandes & Neophytou, 2017). The second axis, focusing on teaching, is distinguished into content, process and final product (Levy, 2008; Tomlinson & Imbeau, 2010).

Figure 2 shows the axes of differentiated instruction.

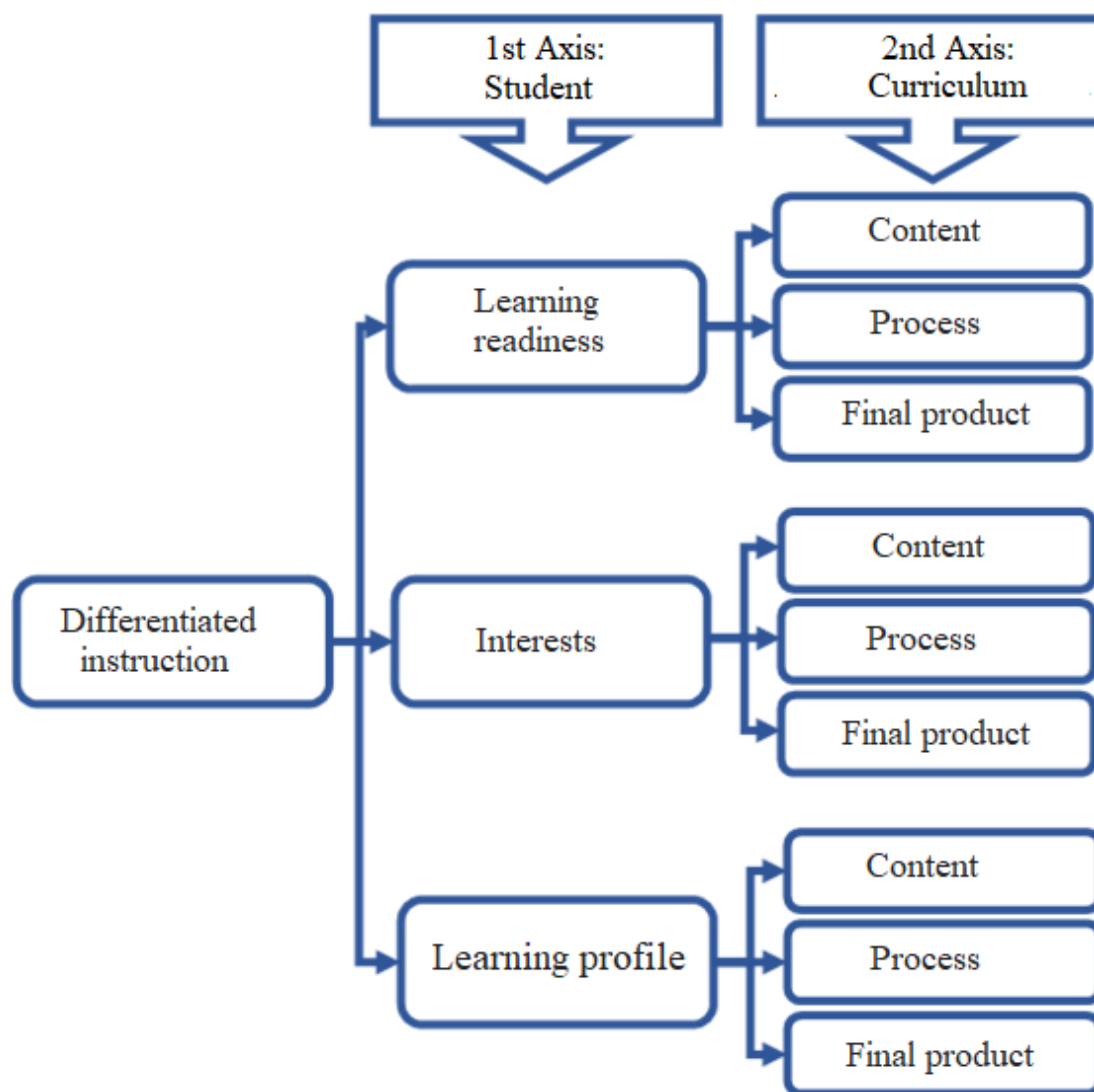


Figure 2. Axes of Differentiated Instruction (Padeliadu, 2008).

Differentiated instruction is a modern teaching practice according to which teachers do not carry out their teaching on the basis of a strictly predetermined framework, in a one-sided way, but successfully implement it by applying detailed planning and following specific principles, strategies, and techniques of differentiation (Lagadinou, 2014; Tomlinson & Imbeau, 2010).

The teacher plays a very important role in the effective implementation of differentiated instruction, as the planning and implementation of it in the classroom is based on him/her, who, satisfying the interests of his/her students, motivates them all and actively involves them in the learning process. By knowing his/her students very well, the teacher can proceed with the planning of his/her teaching and by utilizing techniques, strategies, activities, means and materials, offers his/her students many options (Lewis & Hurd, 2011). In addition, when the teacher has excellent knowledge of the content and important elements of the unit he/she is going to teach, he/she can clearly identify the learning objectives of his/her teaching (Tomlinson & Imbeau, 2010).

When the teacher treats students holistically, he/she knows that in every lesson his/her students are the center of his/her teaching and not the lesson itself. He/She also knows that in some cases emotions precede the lesson, while in others, the lesson itself can cause emotions. In addition, he/she knows that students who do not respect themselves will not acquire much knowledge and will not achieve their individual competence. He/She proceeds to form a dynamic lesson for his/her students, which will remain in their memory, as he/she knows that their experiences and their feelings cannot be left outside the classroom (Tomlinson & Imbeau 2010).

The teacher, by assessing his/her students before, during and after teaching the lesson, assigning them corresponding activities, enhances their participation in activities that arouse their interest and active involvement (Tomlinson & McTighe, 2006).

The teacher, knowing that each student learns in a different way, must take into account the level at which his/her students are. This process leads the teacher to responsibly review his/her professional role and act as a guide of learning and not as a simple transmitter of knowledge (Hockett, 2010).

3. Purpose and Research Question

The present paper is part of a larger research, which aimed to investigate the effect of lesson study on the way in which teachers plan, implement and understand differentiation in the context of teaching the Modern Greek Language course of the 2nd Lyceum class. In particular, this paper aims to investigate the effect of lesson study on the way in which teachers understand differentiation in the context of teaching the Modern Greek Language course of the 2nd grade of Lyceum.

From the review of the Greek and international literature, the need to investigate a basic research question emerged, which is the following: "How does teachers' participation in a lesson study cycle affect how they understand what is and is not differentiation?"

4. Method

For the present study, qualitative research was chosen and the analysis of its data was based on the grounded theory methodology. For the analysis of the qualitative data in this particular research, the procedure described in the constructivist strand of Charmaz's grounded theory (2006) was used, which proposes the following three stages of coding: a) initial, b) focused coding and finally, c) the theoretical coding.

The research was carried out in three Lyceum of two municipalities of Eastern Attica, with the participation of four teachers and eighty students from 09-22-2022 to 11-28-2022. Data collection tools were the interviews of the participants teachers before, during, and after the implementation of the lesson study cycle, the protocols of which were adapted from Hockett (2010). The specific protocols contained clear and comprehensible open-ended questions and

the teachers' answers were given in the context of semi-structured interviews. The questions were adapted according to the research question so that the findings are valid and reliable.

The participating teachers in the study, during the informative meeting before its conduct, were informed about the purpose of the research, the methodology, and consented in writing to participate in it, as the researcher had ensured the absolute protection of their personal data.

Before carrying out the teaching intervention in their school units, the teachers were invited to attend a three-day training meeting held by the researcher for the differentiated instruction and a corresponding one of the same duration, for the lesson study, which started on 09-22-2022 and completed on 10-05-2022. Immediately after, the research was conducted in the school units in three phases.

In the first phase of the research (from 10-13-2022 to 10-21-2022), before the implementation of the lesson study cycle, the researcher first observed the teaching of each teacher separately in his/her class, applying differentiated instruction. After the implementation of the specific teaching, the teachers participating in the research granted an interview to the researcher.

The second phase of the research (from 10-25-2022 to 11-08-2022) included the implementation of all stages of the lesson study cycle. The teachers who implemented the teaching and re-teaching of the research lesson granted an interview to the researcher.

In the third phase of the research implementation (11-16-2022 to 11-28-2022) the researcher observed the teaching of each teacher separately in his/her class. The teachers who had not taught the research lesson were asked to implement it in their classrooms and the teachers who had taught the research lesson and its re-teaching were asked to implement it in their classroom in another unit of the Modern Greek Language course of B Lyceum class the differentiation, after the completion of the lesson study cycle.

5. Results of the Research

5.1. Main Findings

The main findings emerged from the implementation of all three phases of the research and from the answers given by all teachers to the questions asked by the researcher during the interviews they gave her after the completion of each of their lessons.

To the question posed to the teachers before the implementation of the lesson study about what makes a task/activity or lesson differentiated, all teachers failed to answer clearly and comprehensively, as they did not focus on the main characteristics of differentiation. Differentiated or non-differentiated elements of teaching were not easy to distinguish precisely by all teachers, before the implementation of the lesson study cycle. However, teachers B and C without giving full answers approached more the concept of differentiation in a task or lesson. The responses of the teachers to the above question were as follows: Teacher A: *"I think with any form of innovation, some, of course, will succeed more and others less"*. Teacher B: *"The differentiated lesson also takes into account the fact that in my class there are several foreign students who do not know the language very well, so differentiation is necessary for a better*

understanding of the lesson, so I differentiate the lesson or activity accordingly with the needs of the students". Teacher C: *"Variety in all factors promoting differentiation."* Teacher D: *"Discussion, dividing students into groups"*.

Also, to the question of how they determine which students will work with which tasks, all teachers gave different answers, focusing on the student, but not taking into account all three dimensions of him, readiness, interests, and the learning profile, but only one of them. They typically mention the following: Teacher A: *"We said it has a little to do with their particularities"*. Teacher B: *"The main criterion is their interests"*. Teacher C: *"Depending on their learning profile"*. Teacher D: *"Depending on their level and performance"*.

In addition, when teachers were asked to provide a complete definition of differentiation before the start of the lesson study cycle, all teachers provided an incomplete, general, and/or vague definition. Teacher A did not mention the axes of differentiation and did not focus on addressing the special needs of the students, defining it as: *"Any kind of new inventive way to give knowledge to as many children as possible in many different ways"*. Teacher B was more clear in formulating the definition of differentiation by including more elements defining it as: *"Flexibility in the way of the learning process, including various factors such as for example, student interests, readiness, learning profile"*. Teacher C defined differentiation in general as follows: *"Trying to approach the students with different means, methods, techniques"*. Teacher D, focusing on the students' needs, defined it as: *"The way in which the teacher separates the students, makes a differentiated lesson, based on their needs"*.

After the completion of the lesson study cycle, each teacher was asked by the researcher what new knowledge about differentiation was offered by the teacher's experience of participating in the lesson study cycle. All the teachers referred to the knowledge of new techniques and strategies that contributed to the more effective implementation of differentiation. Characteristically, teacher A mentioned: *"Experience in innovative methods, such as cooperative teaching and the 'Think-Tac-Toe' selection of exercises"*. Teacher B focused: *"On the way of presenting the lesson in general. Theory, types of exercises"*. Teacher C said: *"The contribution of the other participants in the program was important because the perspective and development of the teaching was improved by including suggestions for differentiation"*. Teacher D noted: *"My teaching improved by applying differentiation strategies and techniques and most of the children became active and actively participated"*.

Furthermore, when asked if they wanted to add anything or modify their initial definition of differentiation after completing the lesson study cycle, most teachers added elements, giving a more complete definition of differentiation, focusing on content differentiation, the process, and the product, based on the students' readiness, process, and learning profile. Only one teacher did not add or modify her original definition, which was more general. Characteristically, teacher A said the following: *"I think the original definition also expresses my current experience. The differentiation is designed to concern both the content and the process as well as the final product, taking into account the readiness of the students, their interests and their learning profile"*. Teacher B stated: *"Differentiation is the teaching approach in which the content, process and product are differentiated based on the readiness, learning profile and interests of the students"*. Teacher C defined it as: *"Differentiation of the*

strategic approach of the teaching act in terms of product, content and process according to the learning profile, readiness and interests of the students". Teacher D said: "No, I wouldn't change him. This definition is clear and covers me".

Moreover, when asked what elements of differentiation they believed were evident in the lesson planned by the team, all teachers identified these elements. Teacher A was more detailed, who stated that he differentiated the specific lesson, focusing on the needs of the students of the specific class, utilizing the initial assessment and the information obtained from it regarding the readiness, interest, and learning profile of the students. Characteristically, the particular teacher mentions: *"The implementation of the initial assessment for all students through the entry card, which contributed to the more efficient formation of the groups. Also, there were strategies such as cooperative teaching in groups of four students and techniques such as "Think-Tac-Toe" exercises, where each group chooses itself which three exercises to work on, according to its capabilities. Also, the prioritization and gradation of activities. More generally, the team differentiated the content, the process, and the final product, based on the readiness of the students, their interests, and their learning profile, to satisfy their needs, so that everyone participates in the lesson, given their learning peculiarities, in the context of a more attractive lesson for all, which offers more options to the students".* Teacher B pointed out: *"The content with the provision of additional teaching material, the process with the application of various strategies and techniques, mainly with the flexible grouping of the students and the product as the students were given the opportunity to choose activities with the application of the Think-Tac-Toe".* Teacher C emphasized: *"Differentiation was sought at all levels. More evident was the differentiation of content according to the overall profile of the group. Accordingly, the Think-Tac-Toe also worked".* Teacher D stated: *"All the elements of differentiation were evident in the lesson, as the aim was to differentiate based on the interests of the students and based on the level and learning profile".*

Finally, when asked if they believe that their understanding and implementation of differentiation has changed during this year and what they think/believe has influenced this change, all teachers responded positively stating that their participation in the lesson study helped them to understand and implement differentiated instruction more effectively through collaboration to create the research lesson. Characteristically, Teacher A said: *"The lesson study helped me to implement differentiation in a more organized and effective way".* Teacher B pointed out: *"The implementation of differentiation has changed, as it is influenced each time by the data, content, process, product, students' interests, readiness and response and by the collaboration of teachers during the creation of the research lesson".* Teacher C said: *"The practical implementation of differentiated instruction revealed the extent of its effectiveness in practice. Motivating all learners to participate in the teaching process is a trigger for its adoption on a consistent basis. Ultimately, the research lesson process was instrumental in building a more successful differentiated method plan."* Finally, teacher D emphasized: *"Yes, yes. Of course it benefited me. Because I also saw some other perspectives that I was not aware of until now regarding the teaching of the lesson, and I will apply them in my future course as well".*

Furthermore, from the interviews of the teacher participants after teaching the research lesson, evidence emerged that through the lesson study the teachers were motivated to reflect on or reconsider the purpose or effectiveness of various ways in which they had attempted to meet the needs of their students. For example, teacher A found that by using the entry card he was able to assess all of his students and form a more effective composition of the student groups, while with the way he applied before the implementation of the lesson study cycle did not have the possibility to informally assess all of his students. Additionally, it emerged that all the teachers, realizing the importance of flexible grouping, attempted to implement it in the teaching of the research lesson.

Table 1 below briefly presents the most important findings previously mentioned as well as the research question that guided this study.

Table 1. Research Question and Related Findings

<p>Research question:</p> <p>How does teachers' participation in a lesson study cycle affect how they understand what is and is not differentiation?</p>
<p>Related findings:</p> <p>By implementing lesson study all teachers are able to understand what differentiation is and is not, to increase their skills in identifying differentiation in lessons and to reflect more on their own differentiation efforts.</p>

To sum up, by implementing the lesson study, all teachers were able to develop more complete views of what differentiation is and is not.

5.2 Limitations

The existence of certain limitations in this particular study makes it necessary to consider them when interpreting the findings. The small number of teachers who participated in the research is a limiting factor, as lesson study is for most teachers in Greece an unknown teaching intervention, due to a lack of training, and the lack of familiarity with it acted as an inhibitor for their greater participation in this research. It is important to mention that from the review of the relevant research literature that was carried out, it emerged that the number of participants in relevant experimental research, in primary and secondary education, such as the present one, in most of them is four teachers and in much fewer, it is six.

In addition, the duration of the research is another limitation. The pressure of the curriculum on teachers to cover the material to be taught as well as the limited time available within school hours made it difficult to extend it. However, in order to collect data and answer the specific research question, an attempt was made to address this limitation by conducting a sufficient

number of interviews with the participating teachers before, during, and after the implementation of the lesson study cycle.

6. Discussion – Interpretation of the Research Findings

From the overall consideration of the individual findings, specific findings regarding the effect of lesson study on the way teachers understand differentiation emerge.

More specifically, from the question asked to the teachers before the implementation of the lesson study about what makes a task/activity or lesson differentiated, all the teachers did not manage to answer clearly and completely, as they did not focus on the basics characteristics of differentiation. Differentiated or non-differentiated elements of instruction were not easily discerned by all teachers before the completion of the lesson study cycle. However, two teachers without giving complete answers they came closer to the concept of differentiation in an assignment or lesson. This finding agrees with evidence from other relevant research, which point out that differentiated instruction is a complex teaching approach that requires teachers to be familiar with it (Lagadinou, 2014; Maddox, 2015; Rodriguez, 2012; Smith, 2011).

In addition, to the question of how they determine which students will work with which assignments, all teachers gave different answers, focusing on the student, but not taking into account all three dimensions of his readiness, interests and learning profile, but only one of them. Other researchers have highlighted the need for a better understanding of differentiation and how it is implemented by teachers (Mavroudi, 2017; Turner, Solis & Kincade, 2017; Xanthou, 2015).

Furthermore, when teachers were asked to provide a complete definition of differentiation before the start of the lesson study cycle, all teachers provided an incomplete, general, and/or vague definition. This finding is also found in other research, which focus on the difficulty of teachers to correctly define differentiation (Erotocritou-Stavrou & Koutselini, 2016; Joseph, 2013; Tasioka & Griva, 2018).

After the completion of the lesson study cycle, each teacher was asked what new knowledge about differentiation was offered by his/her experience of participating in the lesson study cycle, all teachers referred to the knowledge of new techniques and strategies that contributed to the more effective implementation of differentiation. This finding is also found in other related research, which demonstrates that when teachers engage with differentiated instruction, they gain new knowledge about differentiation as they deepen their holistic understanding of the model and understand their misconceptions (Dack, 2015; Hockett, 2010).

Regarding the question if teachers want to add something or modify their initial definition of differentiation after completing the lesson study cycle, most teachers added elements, giving a more complete definition of differentiation, focusing on differentiation of content, process, and product, based on students' readiness, process, and learning profile. This finding is also highlighted in other research, which demonstrates that lesson study broadens teachers' perceptions of differentiation (Hockett, 2010; Harsono, 2016).

Moreover, when asked which elements of differentiation they believe were evident in the lesson planned by the group, all the teachers identified these elements, as through their collaboration they focused on the needs of the students in the specific class, utilizing the initial assessment and the information obtained from it regarding the students' readiness, interest, learning profile. They focused on the content by providing additional teaching material, on the process by applying a variety of strategies and techniques, mainly by the flexible grouping of the students, and on the product as the students were given the possibility to choose activities by applying the "Think-Tac-Toe". This result is also related to other research, which demonstrate the importance of collaboration between group teachers for a better understanding of differentiation (Erotocritou-Stavrou & Koutselini, 2016).

In addition, when asked if they believe that their understanding and implementation of differentiation has changed during the current year and what they think/believe has influenced this change, all teachers responded positively, stating that their participation in their lesson study helped them implement differentiated instruction more effectively by collaborating to create the research lesson. And other researchers identify this particular finding, as they have demonstrated that lesson study contributes to a more complete understanding of differentiation (Hockett, 2010; Harsono, 2016).

Furthermore, through the teachers' interviews after teaching the research lesson, it emerged that during the implementation of the lesson study, they collaborated and mobilized to learn how to better understand the thinking of their students and respond better to their needs. This finding is also found in other related research, which demonstrate the importance of collaboration for a better understanding of students' needs (Collins, 2017; Ono & Ferreira, 2010; Van Sickle, 2011).

Also, it emerged that all the teachers, realizing the importance of flexible grouping, tried to implement it in the teaching of the research lesson. This finding is also found in other research (Saito, Hawe, Hadiprawiroc & Empedhe, 2008).

Teachers through lesson study were helped to clarify their misconceptions regarding differentiation, to better distinguish differentiated elements of a lesson from non-differentiated ones and to form a more complete picture of what is and what is not differentiation (Hockett, 2010). Also, the lesson study gave the teachers the opportunity to express their reflection regarding their aspirations and their performance in their own differentiation efforts (Harsono, 2016).

7. Conclusions

From the analysis of the qualitative data and study findings, valuable conclusions are drawn about the positive effects of implementing lesson study on how teachers understand what is and what is not differentiation.

More specifically, teachers before the implementation of lesson study failed to clearly and fully answer what makes a task/activity or lesson differentiated, as they did not focus on the key features of differentiation. Differentiated or non-differentiated elements of teaching were not

easy to distinguish precisely from all teachers. In addition, they could not clearly define which students would work with which assignments as by giving different answers, they focused on the students, without taking into account all three dimensions, readiness, interests and learning profile, but only one of them. Finally, they failed to provide a complete definition of differentiation.

After completing the implementation of the lesson study, the teachers gained new knowledge about differentiation techniques and strategies, which allowed them to give a more complete definition of differentiation. Most of them focused on differentiating the content, the process, and the product, based on the students' readiness, process, and learning profile. All identified the elements of differentiation that were evident in the lesson planned by the team and felt that by participating in the lesson study, they understood and implemented differentiation more effectively using flexible grouping and responded better to the needs of the students. They clarified their misconceptions about differentiation, better distinguished differentiated elements of a lesson from non-differentiated ones, and formed a more complete picture of what is and is not differentiation. Finally, they expressed their concerns regarding their pursuits and performance in their own differentiation efforts.

Therefore, from the findings of this research, it follows that the implementation of the lesson study can contribute to the better and more effective application of differentiated instruction. Its small sample, however, requires nationwide research to be carried out in primary and secondary schools and in different teaching subjects, in order to document its findings and create the appropriate conditions for its generalized implementation, which will help teachers to differentiate their teaching more effectively. Also, the training of more teachers in the implementation of the two teaching approaches and their use as multipliers can contribute to the dissemination of relevant knowledge in school units.

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