6th Grade Students' Views about Mathematical Teaching Based on Technology Integration

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Abstract

The aim of this study is to determine the opinions of 6th grade students towards teaching applications developed on the basis of Planning-Practicing-Evaluation model which is an ICT integration model for effective mathematics teaching. While teaching process was designed, Moodle which is a learning management system was used in order to use teaching applications together in a systematic and planned way. Throughout the teaching process, ICT resources such as interactive board, computer, GeoGebra dynamic geometry software, web 2.0 tools (digital stories, videos, animations, games) were used. 33 sixth grade students participated in the research. The case study of qualitative research methods was used in the study. Students' opinions on teaching practices were collected through semi-structured interview method. The obtained data were analyzed by content analysis. As a result, it was determined that the students expressed their opinions towards learning practices increases comprehensibility of the subjects, provides learning opportunities by make and experience, develops positive attitude towards mathematics teaching, attractive and interesting, they associate daily life with mathematics and increases the desire to participate lessons with having catchy lessons.

Keywords: technology integration, mathematics teaching, planning-practicing-evaluation model, students' views

1. Introduction

With the developing technology in the 21st century, it has become important that teachers and students have technology literacy in other words digital competence. In this direction, it is important to raise individuals who are open to new ideas, can make creative syntheses, use technology to reach knowledge, have critical thinking skills to find accurate and reliable information, self-managing, knowing their responsibilities, and have developed leadership skills (Akgündüz, Aydeniz, Çakmakçı, Çavaş, Çorlu, Öner, & Özdemir, 2015; Uluyol ve Eryılmaz, 2015; Göksün ve Kurt, 2017). Drawing attention of today's students who are called as digital natives and participation of innovative technologies that have advantages rather than traditional methods to learning environment became a necessity in terms of supporting and enriching education environment. (Somyürek, 2014). In this context, the use of Information and Communication Technologies (ICT) tools, which innovation technologies (augmented reality, web 2.0 tools, online applications, virtual reality etc.) included, provide important contributions to the formation of meaningful information by visualizing and animating concepts in the teaching of abstract concepts such as mathematics.

Dynamic geometry software (Geogebra, Cabri 3D, Sketch up, Sketch pad, Graphmatica etc.), which visualizes and embodies abstractions in the learning and teaching process and supports effective and meaningful learning, web 2.0 tools, learning management systems, visual reality, augmented reality, different and qualified ICT tools such as QR Code have started to offer new opportunities for students and teachers in educational environments. Today, teachers are tasked with designing learning environments that allow students to use their knowledge, thoughts and skills to create new ideas and include them into the learning environment (Smaldino, Lowther, Mims ve Russell, 2015). At this point, it is emphasized that a student-centered learning environment for the integration of technology into the teaching-learning process is defined, and that instead of memorizing knowledge, the student should create and construct knowledge in their minds using prior knowledge and experience. In the classrooms where constructivist

theory, one of the approaches that deal with the learning teaching process in this way, is applied, the effective use of ICTs is realized at points where learning is provided by technology. In this context, one of the key of theories in integrating technology into learning environments is seen as constructivist theory. (Cox ve Cox, 2009; Aldoobie, 2015; Gilakjani, Lai-Mei ve Ismail, 2013).

The impact of constructivism on classroom practices to understand the potential of technology in the development of teaching practices was examined by many researchers and it was demonstrated that constructivist strategies are effective in ensuring technology integration. (Venkatesh, Rabah, Fusaro, Couture, Varela, & Alexander, 2016, Brush& Saye, 2000; Nanjappa, & Grant, 2003; Irby, 2017). Maddux and Johnson defined teaching integration Type I use as using technology as a fast tool in data transcription in learning and teaching and Type II use as computer usage in order to present new and better teaching methods. In Type II use, the student actively manages his learning and reflects what he learns using technology. The teacher only designs a technological environment for students' learning.

The modeling and characteristics of technology integration such as in-class integration models, school development models, technological pedagogical content knowledge model that describes the knowledge of the teacher have been put forward as to how the technology should be integrated into the teaching process. These models have been developed in order to enable the process of ICT integration to be carried out in accordance with a model and to maintain the process in a systematic manner (Mazman and Usluel, 2011) In the studies conducted, it was determined that the mathematics education practices in which innovation technologies are integrated have positive effects on the motivation, permanence, academic achievement and attitude of the students (LaPorte, Sanders, 1993; Springer, Stanne, Donovan,1999; Becker, Park, 2011; Huang, Yang, Liou, 2017; Wu, Hwang, Yang, Chen, 2018).

Despite these effects and the results of the study, many experienced teachers who need to reach the world of children born in a very fast developing technological environment and meet the interests and needs of the them and update the education and education environment resist to the integration of technology in education (Wachira ve Keengwe, 2011). Since teachers' attitudes towards technology and pedagogical beliefs about teaching-learning will determine the attitude of a person, negative beliefs about technology are seen as a major obstacle in achieving technology integration. Many teachers think that technology use in classroom wastes time and instead of integrating technology into the classroom, they use it as an example to support the teaching of technology. (Hew and Brush, 2007)

Two types of obstacles were detected in the research conducted on why the integration of technology in the teaching environment is limited and why it is not used at all. The first environmental preparation (eg, hardware, Internet access) and teacher information were categorized as lack of practice examples and the secondly teachers' beliefs. It is also stated that the availability of technology provides effective technology integration (Norris, Sullivan, & Poirot, 2003) but that knowledge about teaching technologies, pedagogy and content are required in order to improve teaching (Mishra and Koehler, 2006).Teachers' negative beliefs about current practices are appeared as the second reason for delaying or preventing technology integration. Since the teachers' beliefs reflect real teaching practices and lead to the adoption of technology in this respect, it is thought that the effects of technology integration practice and the effects on students should be introduced to teachers more. Because, teacher beliefs are more effective than teacher knowledge. In this respect, examining the examples that integrate technologies differently into the teaching and attempting to change this resistance will help to improve the applications of technology integration. (Kim, Kim, Lee, Spector, & DeMeester, 2013).

One of the ways that teachers need to model how new technologies should be used by students who are consciously expected to be digital citizens is to integrate technology into lessons effectively. Because the internet brings a new and different citizenship for everyone. Gradually more people, especially young people, are relocating their social online interactions to media, such as Facebook and Instagram. However, as people move to these new platforms, they are less likely to participate in traditional citizenship responsibilities (Bennett, 2008). Teaching students to be productive citizens is through teachers learn how to integrate innovation technologies and social networks into their lessons, taking into account the constantly changing social environment. Thus, teachers can model appropriate social networking behaviors and technology use for students. (Winn, 2012). For sure, the most important element at this point is to provide an educational environment that will provide students with safe internet and social networking. The benefit of creating our own environment is to limit participants to teachers, students and administrators (Irby, 2017).

In this direction, it is necessary to examine the effects of designing safe learning environments which will guide and attract the teachers with the sample practice results on the technology integration and which will be the model for the students to adopt the digital citizenship principles. In this context, the aim of the study is to determine the opinions of the sixth grade students about the educational practices developed based on the Planning-Practicing-Evaluation (PPE)

model which is the ICT integration model for the effective mathematics education developed by Yıldız (2013).

1.1 Planning-Practicing-Evaluation Model

In order to be able to use the ICT effectively in the learning and teaching process, many models have been developed for determining the stages of the integration process or for explaining the process. (Mazman ve Usluel, 2011)

Some of these models are a five-stage model of computer technology integration developed by Toledo (2005) for teacher training programs, The Systematic Planning Model, which explains that the ICT integration can be realized in three levels: curriculum (macro), subject (meso) and course (micro) and developed by Wang and Woo (2007), The technological pedagogical content knowledge model, which introduces the components that a teacher should possess in order to provide effective ICT integration as revealed by Mishra and Koehler (2006), Pedagogy, Social Interaction and Technology Generic Models developed on constructivism, interaction and utility dimensions by Wang (2008), The e-capacity model developed by Vanderlinde and Braak (2010) to develop ICT integration in schools and to create a sustainable environment within the context of the factors that prevent the integration of ICT into teaching programs.

In this study, Planning-Practicing-Evaluation (PPE) model developed by Yildiz (2013) is taken as a model of ICT integration in mathematics education. The Planning-Practicing-Evaluation (PPE) model, one of the key components of ICT integration and developed to provide effective mathematics teaching and ICT integration, which is necessary for the initiation of the process and considers managerial support, technical support, infrastructure, curriculum support, teaching ICT skills as a precondition suggested as a model that can be used in the cases where there is an access to BIT and curriculum support and administrative support are provided. The planning stage, which consists of the processes such as “regulation of the content”, “selection of teaching method”, and “selection of appropriate ICT”, of PPE model is considered as the strongest stage of the model. The Practicing stage which follows the Planning stage, involves the inclusion of the teaching content revealed in the Planning stage into the teaching-learning process in three stages: "before the lesson", "during the lesson" and "after the lesson". However, during the development of the PPE model, the "lesson" stage could not applied. For this reason, it is estimated that the use of ICT in the classroom environment may lead to different situations and may require different classroom management skills. It is considered to be the weakest link of the “during the lesson" stage, and testing the model in the classroom environment is thought to help strengthen this stage. The "Evaluation" stage which is not considered as a separate stage, is planned as a process to be carried out by evaluating the activities in the process and correcting the deficiencies and making improvements to the next process. By determining the opinions of the students on the application process of the model based in the study, it is thought that the question what happens in the classroom? will be lighten by the students’ point of view.

2. Method

2.1 The Model of the Research

In this research, special case study method has been adopted in the context of descriptive approach due to it aims to elaborate, extensively describe and explain the views of sixth grade students in the course of the teaching practices developed on the basis of PPE model in detail. The reason for choosing this method is that it allows for the in-depth investigation of certain aspects of the problem investigated and the possibility to work in a short time. (Çepni, 2007).

2.2 Study Group

The study group of the research is comprised of sixth grade students studying at a public school. 33 of sixth grade students participated in the research and 10 volunteer students were interviewed. The study group of the research was selected by the appropriate sampling method from non-random sampling methods. Appropriate sampling is easier for the groups to be involved in the research process, or more accessible. Due to the limitations in terms of time and workforce, appropriate sampling method was used for the study group to be selected from easily accessible and practicable units. In addition, the teaching practices that will be realized by using the PPE model in the study have been chosen for the fact that in the working group students should have participated in various lessons in the computer laboratory for 2 years and to be experienced in interactive smart board taking into consideration the basic components of ICT integration such as technical support, managerial support and infrastructure (Yıldız, 2013).

2.3 Data Collection Tools

Students' opinions on how to evaluate the teaching practices developed on teaching practices on the basis of the PPE model were collected through a semi-structured interview form. While the semi-structured interview form was

developed, 2 mathematics education specialists and 3 primary mathematics teachers were investigated in order to evaluate the issues in terms of eligibility, clarity and suitability of the questionnaire. Some of the items created in the direction of expert opinions have been eliminated and some of them have been made necessary in terms of express. Pilot interviews with three sixth grade students were conducted to determine the feasibility and functionality of the developed form and additional questions were added to re-examine questions that were not sufficiently understood by the students and to provide detailed information on some of the questions. The semi-structured interview form consisting of 3 questions and controlled by expert again was finalized.

In the semi-structured interview form, students were asked about their experiences on interactive applications on Moodle and GeoGebra applications and materials that prepared direct to prepared lesson materials, whether they liked this experience, their thoughts about the use of these materials in the teaching process, and what points were that they most liked or had difficult.

2.4 Process

The PPE Model, which fully covers the integration process, consists of three main parts. According to the model; after integration and administrative support, infrastructure, curriculum support, and ICT skills components are provided, the integration process starts. By ensuring the realization of these components, a favorable environment for ICT integration is established.

2.4.1 Planning Stage

Regulation of contents: At this stage, it is aimed to prepare the most appropriate environment for the students to learn by taking into consideration the selected achievement and grade level, student preliminary information, possible misconceptions and suggestions in the 6th grade Mathematics Curriculum.(MNE,2017) For this purpose, preliminary knowledge about the acquisition and possible misconceptions in the literature have been determined by choosing the "draws a height of an edge in parallelogram", "forms area connection of parallelogram and solves the related problems", "forms area connection of the triangle and solve the related problems", in the 6th Grade Mathematics Curriculum, the next steps were taken taking into account the explanations about the achievements.

Teaching Method Selection: The regulation of the developed contents has been made within the framework of the requirements of the 5E learning cycle model. For example, a digital story containing the real life problem named "Sabri's Height Problem" was used for interest and attention in the entering step, and it was converted into animation using Animaker, one of tools of web 2.0 tools, and presented to students in Moodle environment (Figure 1).

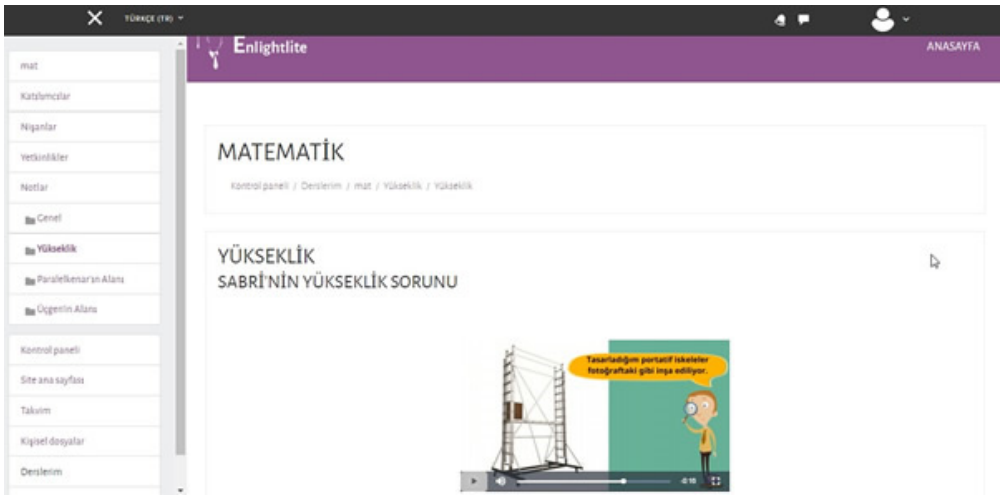

Figure 1. An Animation of the Daily Life Problem Named “Sabri's Height Problem

There is also a video in which the students can visualize the concept of height in their minds in relation to the height problem in the case of the problem in the animated problem shown in Figure 1. At this stage, a dynamic worksheet containing GeoGebra activity called "Height Activity" developed for solving the problem named "Sabri's Height Problem" containing exploration questions directed to the drawing of the height, which is the pre-condition information of the relevant acquisition, was added to the Moodle environment (Figure 2)

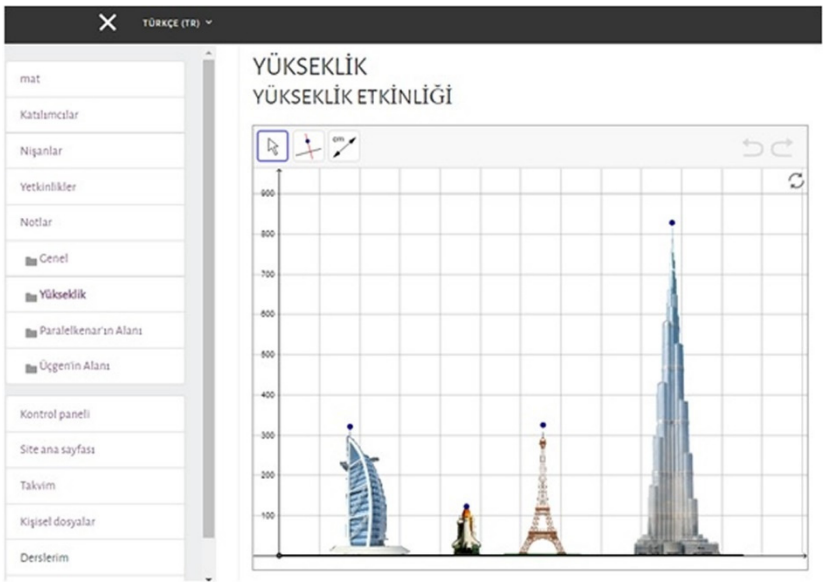

Figure 2. "Height Activity" Visual of GeoGebra Application

Appropriate ICT selection: It is important to choose the ICT to be used in the teaching process accessible, proper student-teacher skill and the level of selected content. For this purpose, attention has been paid to the school's classroom of information technology where teaching practices are to be applied, an institution with interactive boards and internet access in every class. Moodle which is a learning management system was used in order to use teaching practices which will be realized during the lesson together in a systematic and planned way. Developed educational contents were added to Moodle and ICT resources such as interactive board, computer, GeoGebra dynamic geometry software, web 2.0 tools (digital stories, videos, animations, games) were used throughout the teaching process. The website has been designed with a simple theme in order to make it easier for the participants to focus on the course content while the content is added to the system after the ozanakademi.com website has been created by Moodle.

2.4.2 Practicing Stage

At the beginning of the lesson, a research question which will catch the students attraction to subject was asked to the students, groups were created during the lesson and each group was provided with computers to access the content added to the Moodle website. Teaching was realized with the opportunity to interact with digital stories, animations, GeoGebra digital work sheets and directed exploration questions. After the Lesson, it is aimed to perpetuate of students ICT usage also except lesson with sending educational contents on education given using by Moodle to students after teaching practices which realized during the lesson.

2.4.3 Evaluation Stage

It will not be considered as separate process in model and realized in whole of process actively. In this direction, the data obtained from the process evaluation are used for the development of the next step. In order to increase the reliability of the evaluation made, data should be collected in different ways and data diversity should be increased. For this purpose, it is aimed to carry out discussions on the teaching practices that are realized by taking reflections about the process from the students. It is also aimed at students to evaluate themselves and each other through self-evaluation and peer evaluation. Only the opinions of the students were included in this study.

2.5 Data Analysis

A content analysis technique was used to analyze the data obtained with the semi-structured interview form. The main purpose of content analysis is to reach concepts and associations to explain the collected data (Yıldırım & Şimşek, 2008). For the analysis of the content, the voice recordings of the interviews made for the analysis of the data of the research were written. The responses of the candidates to semi-structured interview questions were coded by 2 field experts and the relationship between the coding results was examined in the process of coding the data, finding the themes (categories), regulation of the codes and themes, and analyzing and interpreting the findings. Encoder reliability (Miles and Huberman, 1994) was determined as 92.85%.

3. Findings and Comments

In the context of the study, in the teaching practices realized based on PPE model, In students were asked about their experiences on interactive applications on Moodle and GeoGebra applications and materials that prepared direct to prepared lesson materials, whether they liked this experience, their thoughts about the use of these materials in the teaching process, and what points were that they most liked or had difficult. Codes related to student opinions on the practices of the mathematics lesson are given in Table 1 with percentage and frequency values and sample opinion expressions.

Table 1. Students' Opinions on the Application of Mathematics Lesson Based on PPE Model

Codes	f	%	Sample Opinions
Increasing comprehensibility	31	22.46	"I wish other lessons were like that. I understood everything very well. " The practices made me understand the subject better."
Developing positive attitude towards mathematics	9	6.52	"I always wanted to join this lesson. We did not memorize, so I loved it. "
Providing stick in the mind	7	5.07	"I would have struggled when you told me, but it was easier to keep in mind that we were doing lessons here."
Providing learning by making and experiencing	12	8.70	"Thanks to your guidance, we learned the subjects in lesson by ourselves. This will stick of our mind better. We saw the subjects visually and we made the practices by ourselves were effective to comprehend."
Entertaining	8	5.80	"I want to have fun in lesson. I had a lot of fun in this lesson. I would like to study lessons like this way. "
Attractive	8	8.50	"We used the smart board, and we paid more attention because we used it in daily life."
Interesting	18	13.04	"Activities, GeoGebra events drew my attention, for example, the first time I saw a lesson that everyone uses computer."
Associating mathematics with daily life	3	2.17	"The problems we used were daily problems. We learned faster, my teacher. It was a different practice and I liked it very much. "
Increasing the desire to join the lesson	7	5.07	"It was a very nice lesson. We always studied because we found ourselves. We had fun. I felt I participated in the lesson. "
Providing quick / easy learning	12	8.70	We learned faster, my teacher. It was a different practice and I liked it very much. "
Learning without memorizing	9	6.52	"Mathematics is often taught in class, we open the smart board sometimes. This time we used smart boards and computers in the IT class. We did teamwork. It was good. Helping each other with my friends made me understand the subject better. We did not memorize the information, we discovered. "
Providing effective learning	3	2.17	"... I am very surprised because I did not know what to do first. But I get used to as I attend the class. I love mathematics. I thought I learned mathematics better with this lesson ... and said of me that if I study I can understand better. I believed I will understand activities by doing."
Providing comprehensibility by visualizing shapes	11	7.97	"The problem of the smurfs, the problem of the kite and the problem of measuring the height of the building were very interesting. It's because we made it visually on smart board and computer. Normally, if we had solved it on the board, or you gave us the formulas before, the information would not imprint on our mind. It was visual and we did by ourselves, so it was very nice. I had not known there was such a lesson, but I know now. "
Total	138	100	

When the data in Table 1 are examined, it is seen that students' opinions on mathematics teaching practices in which moodle, Geogebra, interactive smart board, interactive practices are collected under the 13 codes, in which the technology is integrated. These codes were determined as, increasing comprehensibility, developing positive attitudes towards mathematics, providing memorability, providing to learning by doing and experiencing, entertaining, interesting, attractive, associating mathematics with daily life, increasing the desire to participate in lesson, ensuring fast/easy learning, learning without memorizing, providing effective learning and providing comprehensibility by visualizing the shapes.Among the identified codes, the code that has the highest frequency value in the thought that the teaching practices in the mathematics course increased the "comprehensibility of the subjects taught" (22.46%). S5 and S8 stated the following statements about this issue:

S 5: "Wherever I had difficult in, you lead me. I've never had difficulty. I understood that I could learn mathematics better "

S 8: "I wish other lessons were like that. I understood everything very well. " The practices made me understand the subject better."

S6, one of the students, stated that they learned by structuring, doing and experiencing by using the teaching practices that they made:

S 6: "The teacher did not tell us as it was in the book and in the notebook. We did the activities with using the computers. You just lead us. Now this information will stick in my mind better. "

S2, one of students, said that he learnt more permanently without memorizing and stated his attitude towards mathematics as:

"It was a very nice lesson in that way. Normally I was always memorizing, but it's not necessary anymore, it was catchier with this way. I liked the lesson, I was afraid due to I would not understand the mathematic lesson. But I conquered the fear and I understood that I can be successful in mathematics."

When S2's views are examined, it was seen that the mathematics lesson in which the technology is integrated reduces the anxiety and fear towards the mathematics course of the student.

Another question directed to students is "What are your thoughts on using technology in mathematics lessons?" The codes obtained from the students' views on the use of technology in mathematics lesson as a result of content analysis are given in Table 2.

Table 2. Student Opinions on the Use of Technology in Mathematics Lessons

Codes	f	%	Sample Opinions
Provides memorability	2	6.25	"It stuck in my mind better because we made all of the activities. So I think using computers in mathematics lessons makes it more memorable
Increases the desire to join the lesson	3	9.38	"I wanted to go to the blackboard more. I think it was more useful. I felt I participated more in lesson than ever. With smart boards and computer programs, we will participate in lesson better
Entertaining lesson	5	15.62	"We did a lot of activities. We watched the animations. It was so nice to use the computer while finding the solution We found everything. There's no need to memorize formulas anymore. We had fun. We learned by having fun. Such lessons provide amusing learning
Increasing comprehensibility	4	12.50	"These lessons were easier for me. You told me with visuals. We found everything, thus it stuck in my mind better. Computer and other tools make it a lesson to be comprehensible"
Provides learning by discovering	3	6.38	"We found the subjects by trying. We moved the slides in GeoGebra and solved the questions step by step. We found out with our friends without memorize it. It was so useful for us. "
Interesting	5	15.62	"For the first time I've been studying with a computer, everything was very interesting and I think it will be interesting with this lesson."
Positive attitude	10	31.25	I did not use to attend mathematics lesson, but now I want to participate. I did most of the things, studying at laboratory made me love mathematics again.
Total	32	100	

When the data in Table 2 are examined, it is seen that opinions obtained for the use of technology in mathematics teaching are collected under 7 codes. The majority of students believe that the use of technology in mathematics education has improved the positive attitude towards mathematics (31.25%). S10, one of the students, stated their his on this subject as follows:

"In the past, I was in bad odor with mathematics but I liked mathematics which we learnt technology in GeoGebra with the activities that we made.

Students S9 and S1 expressed their desire to participate in lessons that are taught using technology:

"... I got it all better, I got more interest. I did not use to attend mathematics lesson, but now I want to participate. It made me love mathematics again."

"It was a very nice lesson. We studied hard because we found ourselves. We had fun. I felt I participated more in lesson than ever.

With these findings, it becomes clear that the use of technology in mathematics lesson has created a learning environment that makes it easier to understand and catchy the mathematics as a lesson for learning, fun, and increases the desire to participate in the lesson. Moreover, it is seen that in the direction of the findings obtained, the students developed positive attitudes towards mathematics lesson using technology in mathematics lesson.

The third question asked the students is to determine their thoughts on how to compare mathematics lessons with technology integrated with ordinary school lessons. Table 3 shows the codes obtained from the students' opinions regarding the comparison of the lessons made by the technology integration with the normal course as a result of the content analysis.

Table 3. Comparison of the Mathematics Lesson with the Integration of Technology with a Standard Mathematics Lesson

Codes	f	%	Sample Opinions
Providing memorability of information	7	28	"For the first time we have used computers and I easily remember all the practices that we made. I still remember"
Opportunity to discovery	2	8	"We found the subjects by trying. We moved the slides in GeoGebra and solved the questions step by step.
More comprehensible	3	12	"I used GeoGebra for the first time. The figures were useful to understand for me. We visually saw it. "
More participation in the lesson	2	8	"I would like to participate less often in lesson. "I always wanted to join this lesson.
Entertaining	2	8	I understand less in other lessons. The teacher would explain it on the board, but it would not stick in my mind. I understood in this lesson much better. The lesson was fun because it was like a game, it was not boring at all. "
Providing easy learning	2	8	"These lessons were easier for me. You told me with visuals. We found everything, thus it stuck in my mind better. I learned easier than the other lessons"
The visuals were better	2	8	"I can conjure up a mental picture of shapes. The activities are always stick in my mind. Because this lesson was more visual "
Learning without memorization	3	12	"Normally there were somethings that I had to memorize, but it's not necessary anymore I found the necessary information and I used it "
Reducing concern	2	8	"... I liked the lesson, I was afraid before because I would not understand the mathematics lesson, but I conquered the fear and I understood that I can be successful in mathematics." I usually pray in lesson my turn is not to come. Because I do not know what I'm doing, I found it in this lesson and I did not have to be afraid it was easy to tell "
Total	25	100	

It is seen that 8 codes are determined when the students' thoughts on comparing a standard mathematics lesson with a mathematics lesson integrated with the technology are examined. It was seen that the students did not give a negative opinion and the students were willing to review this kind of lessons. It has been seen that students are more likely to find mathematics lessons in which technology is integrated to make information more catchy (28%). S10, one of the students, stated their his on this subject as follows:

"I would have struggled when you told me, but it was easier to keep in mind that we were doing lessons here."

S5, indicated his opinions as following:

"If we had normal lessons, we would not understood better, and our teacher had to tell us three or four times. When we first saw these activities, we understood. I learned much easier "

S1, one of students, stated his views as follows:

"In other lessons we just listen. We write. We memorize. As such, I conjure up a mental picture of information. It's better to learn with a computer. "

S4, who said that he discovered his knowledge and developed a positive attitude towards the lesson, stated his views as follows:

"It was more beneficial and good to us to discover the area formula thanks to you lead not you told us. In the future, it will be more beneficial to us, beautiful and productive. I love and I am happy. I conquered my fear."

In the study, it was determined that students were surprised at the fact that they had a different lesson at first, but that there was not a problem with the activities and ICT tools. In the direction of these findings, it is revealed that the lessons made by technology integration are more reminiscent than the other lessons, and that students learn more useful and easier to understand lessons by exploring their own knowledge with participating in lessons and without memorizing it. Findings also show that the integration of technology is effective in reducing the concerns of students against mathematics lessons according to other courses.

4. Discussion and Recommendations

In this study, students' views on the practices of mathematics lesson developed in the framework of PPE model, one of technology integration models, are examined. In the light of findings obtained, it was determined that the students expressed their opinions towards learning practices increases comprehensibility of the subjects, provides learning opportunities by make and experience, develops positive attitude towards mathematics teaching, attractive and interesting, they associate daily life with mathematics and increases the desire to participate lessons with having catchy lessons. When student opinions on the use of ICT in mathematics are examined, it is concluded that the students have developed a positive attitude towards mathematics lesson and they studied an interesting and entertaining lesson. In addition, when the students' opinions on the comparison of the mathematics taught by the integration of ICT with the mathematics lessons in the school, it was achieved that students expressed their opinions that they discovered information without memorizing, it was more visual lesson, increased students' intentions towards mathematics and information were more catch. Similarly, Şahinoğlu (2012) has found that Moodle-supported mathematics teaching has developed positive attitudes among students, and that the teaching management system has increased interest in the classroom. Birgin, Özkaya and Duru (2014) survey of students in the mathematics lecture on the use of GeoGebra opinions, the opinions of students as lessons were enriched visually, provided better and catchier learning on subject and studied entertaining and interesting lesson without memorizing were achieved. When Acar (2015) received students' views on the use of GeoGebra and reached the result that students learned better and enjoyed learning. In addition, in the study, he also achieved the opinion that mathematics lesson should be taught by using GeoGebra with self confidence and enthusiasm of students which arisen due to they comprehend the subject and find information with teamwork. Sarıhan Musan (2012) has reached to the conclusion that in terms of the opinions he has taken for the use of dynamic mathematics software, the process is made easier with the ease of operation and visualization provided by the computer and the subjects are more understandable. In addition, according to the result of this study, it was determined that the students thought that the lessons learned using computers were more beautiful, amusing and entertaining. Sünkür, Arabacı and Şanlı (2012) reached the conclusion that students enjoyed and relished the use of interactive board.

In a similar vein, there are many studies that indicate that students expressed positive opinion about technology integration and the use of technology in mathematics education. One of the most important elements of this is the opportunity to provide equal opportunities for students through technology integration and materials provided to the

students in the learning environment, Moodle and interactive applications. It is also seen that the applications on attitudes and beliefs (Hew & Brush, 2007; Tüysüz & Çümen, 2016) which are considered as obstacles in front of technology integration, are positively influenced students. Technological tools and advanced applications are effective in the process of providing effective learning in understanding the mathematics lessons that have an abstract structure, which are known to have problems especially in understanding and in relation to daily life. This research is an exemplary resource for teachers on the lack of a technology integration plan that is among the obstacles to technology integration (Hew & Brush, 2007). By courtesy of Moodle used, both process and outcome evaluations of students can be done in a practically and feedback is given. In this context, students were able to control their own improvement by following that whether they learnt through the feedback they received. In addition, it was observed that the practice made the students understand the lesson better. Instead of examining the students who generally evaluated in terms of success, it is thought that creation of learning environments in which technology integrated and can develop 21st century skills will contribute development of individual profile that new century needed. In this context, it is suggested that studies should be carried out by using different ICT integration models, studies aiming to evaluate the academic achievements of the students and the creativity of their motivations should be conducted. In addition, by examining the didactic structure of events in the planning process in terms of the classroom environment, more information on the behavior of teachers and students can light the integration process. The learning environment can be enriched by using different ICT tools in the learning-teaching process. ICT integration can be realized in different learning fields and different disciplines so that both disciplinary and multidisciplinary teaching practices can be realized.

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