Examination of The Opinions of Mathematics Teacher Candidates on Digital Story Design[1]

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Abstract: It is seen that new methods and techniques are employed in education parallel to the technological developments and changes. One of these is digital stories, which are used in many areas in education one of which is mathematics education. The purpose of the present study was to examine the opinions of primary school mathematics teacher candidates after their digital story creation experiences. The case study design, which is one of the qualitative research methods, was used in the study. The participants were 40 primary school mathematics teacher candidates who were studying in the second year of a state university education faculty. The data of the study were collected with a semi-structured interview form that consisted of 4 questions, which was created by scanning the literature and receiving expert opinion. The data were analyzed with the content analysis method. As a result of the study, it was found that creating a digital story is the most time-consuming disadvantage of the digital story. When the views on the contribution of digital stories to the mathematics course were examined, it was determined that digital stories were the most remarkable. In addition, teacher candidates stated that digital stories provide the daily life mathematics relationship. Regarding the general evaluation of the course, it was found that there were positive and negative opinions.

Keywords: *Digital Story, Mathematics Teacher Candidates, Experience, Opinion.*

1. INTRODUCTION

Stories have been among the means of expression for humans since ancient times. People express past events or the events which may be experienced through stories, which are also used in education. One of the biggest reasons for this can be the funny side of stories (Turgut & Kışla, 2015). It was reported in previous studies that the use of stories in education improves creative writing skills (Demir, 2012) with positive effects on the duration of attention (Varol, et all., 2020). It was also reported that stories increase the desire of students to learn and provide meaningful learning (Demircioğlu, et all., 2006). The methods and techniques used in education have changed in our present day with the effect of technology. The reason for this is reported to be the necessity of using technology for being educated, to use technology effectively in daily lives, and to avoid any disconnection from education (Robin, 2008). The storytelling has changed for this reason. The concept of the digital story was created by Dana Atchley with the inclusion of technology in educational processes (McLennan, 2007). Digital stories are a dynamic and beautiful combination of narration and technology (Taylor, et all., 2018). Digital stories consist of the combination of computer-

based images, texts, video clips, accompanied by music to present information on various subjects (Robin, 2016). Digital stories have various usage areas such as healthcare and community activities (Rossiter & Garcia, 2010). In education, on the other hand, it is employed in various educational levels (Kocaman-Karoğlu, 2015) from pre-school to higher education (McLennan, 2007). One of the reasons for this wide range of usage in the educational field is that digital stories contribute to student learning (Sadık, 2008). Digital stories also increase the motivation of students to improve their performance (Doğan & Robin, 2008). Robin (2008) reported that digital stories improve the research, writing, presentation, organizing, evaluation, and problem-solving skills of users. Foelske (2014) reported that digital stories improve literacy skills, content knowledge, and 21st century-related skills.

There are many digital story types, and it is possible to classify these under three main headings, which are expressed as personal narratives, historical documentaries, providing information and instructions about the concept or application. Important events in an individual's life are told in detail with personal stories. Dramatic events, which help us understand the past are examined through historical documentaries. The purpose is to give information or instructions about a concept or application in the other group. All digital stories have the quality of being informative and instructive. However, some stories reflect the teaching materials in content areas such as mathematics, science, health education, and instructional technology in the third group (Robin, 2006).

How to create a digital story is a question, which comes to mind at first blink. Creating a digital story is a process, which was expressed by Jakes and Brennan (2005) like writing, script development, storyboard development, finding multimedia, and creating and sharing the digital story, respectively. Although technology is not necessary at some stages of this process, it must be used especially in finding multimedia and creating digital stories. Also, some components must be considered in the process of creating a digital story. There are different researchers in the literature who defined the components of the digital story. One of them, Robin (2008) argued that digital stories consisted of 7 components, which were perspective, dramatic question, emotional content, voiceover, music, economy, and pacing. To determine the viewpoint, the question of "What is the main point of the story and what is the viewpoint of the author?" is asked. The dramatic question was expressed as a question at the beginning of the story to attract the attention of the audience and to be answered at the end of the story. Emotional contents pose a serious issue connecting the story to the audience. Voice is used as a method to personalize the story to help the audience understand the context. Digital stories also necessitate music or other sounds to support the story (i.e. the music component). The economy component refers to using adequate content to tell the story without overloading the audience. The final component, which is the speed, is about the rhythm of the story and how slow or fast it goes on. Lambert & Hesler (2018) listed the digital story components as self-disclosure, personal voice, being experimental, painting, music, length, design, and intention. The self-disclosure component was referred to as the expression of the narrator regarding the purpose of the story by creating a sense of curiosity and proximity in the audience. The storyteller making the audience feel while voicing the story is related to the personal sound component. In the experiential component, the

storyteller conveys his/her experiences regarding a moment or event. Preferring a small number of still images rather than moving ones is in the scope of the picture component. The presence of music or ambient sound in the background in the music component is taken into account to add meaning and effect to the story. The length and design component of a digital story is less than five minutes, usually between two and three minutes. The choices of the storyteller about participation, distribution, and ethics are in question to reach more audiences in the intent component.

2. LITERATURE REVIEW

In education, some of the uses of digital stories are mother tongue education (Kurudayıoğlu & Bal, 2014), science (Akgül & Tanrıseven, 2019; Ulum & Ercan -Yalman, 2018), preschool education (Türe - Köse & Bartan, 2021), foreign language education (Kaya & Tekiner -Tolu, 2017; Tatlı & Aksoy, 2017), Turkish teaching (Dayan & Girmen, 2018; Ertan- Özen & Duran, 2017), and social sciences education (Ünlü & Yangın, 2020). Digital stories are also employed in mathematics education. In addition to these, in their study, Ersözlü & Yalçınalp (2020) examined the Turkish studies in the field of the digital story between 2016-2020 in the Google Academic Index and National Thesis Index databases. When the distribution of studies was examined according to disciplines, it was found that studies conducted on mathematics were limited (f=2, 7.14%).

When the mathematics studies on the digital story were evaluated, it was found that Inan (2015) worked with pre-school teacher candidates using digital stories for teaching mathematics. In this study, opinions of pre-school teacher candidates using digital stories were recorded. The effect of pre-school students watching digital stories on their reactions to mathematics courses was also examined. Walters, et all., (2016) examined the effects of problem-solving training by using MATH-EOS on the understanding of the relations of teacher candidates between visual, auditory, and verbal representation and critical thinking in mathematics. Özpinar, at all., (2017) examined the effects of mathematics courses taught with digital stories on the academic achievement of 8th-grade students and the opinions of teachers and students on the application process. A topic-based study that was conducted with digital stories in mathematics by Karaoğlan- Yılmaz, et all., (2017) aimed to determine the mistakes and misconceptions of fourth-grade students about fractions and to overcome these mistakes and misconceptions with digital stories. In some previous studies, it was reported that a model was developed for teaching mathematics with digital stories (Albano & Pierri, 2017). İslim, et all., (2018), however, examined the use of digital stories in mathematics education, the opinions and experiences of mathematics teachers, and how the participants determined the stories about digital creation, used and evaluated. Dalim, et all., (2019) conducted a quantitative study with 150 teacher candidates that included mathematics teacher candidates. In their study, the experiences and perceptions of teacher candidates regarding digital storytelling were identified. Niemi, et all., (2018) examined how students acquired 21st Century competencies by using digital stories, active knowledge creation, and collaboration in mathematics learning. Another subject-based study was conducted by Dinçer (2019). Dinçer (2019) made use of digital stories in teaching 6th grade mathematics courses in Integers and Algebraic Expressions sub-learning areas. They also investigated the effects on

students' academic achievement, attitudes towards mathematics courses, motivation levels, conceptual learning-example levels, and views on digital story activities.

When the Ministry of National Education Mathematics Curriculum (MoNE, 2018) is evaluated, some competencies which must be acquired by mathematics teachers stand out. One of them is digital competence. It was reported in previous studies that digital competence is the safe and critical use of information and communication technologies for business purposes, daily life, and communication. Another competence in this respect is the competence in technology. Competence in technology is seen as the application of knowledge and methodology in covering the perceived human desires and needs. Teachers can acquire these competencies, which must be acquired by teachers, with the help of in-service training or courses provided in higher education when they are still teacher candidates before they start their profession. These competencies must also be considered in the process of preparing teacher candidates for their profession. One of the techniques, which can be used to realize these competencies is the digital story concept. Teacher candidates must develop a deep understanding of the digital storytelling process and its uses in classrooms to use digital stories as an effective tool. For this reason, teacher candidates must create digital stories based on certain academic standards that are outlined by the Ministry of National Education or a particular discipline (Sessoms, 2008). When the literature was reviewed, it was found that there are studies conducted with teacher candidates regarding digital stories (Condy, et all., 2012; İnan, 2015; Ulum, 2017).

Primary school mathematics teacher candidates were given the experience of designing a digital story within the scope of a course In the present study. The purpose was to examine the opinions of teacher candidates about the process. It is considered in this respect that a good analysis of the process regarding the design and implementation of a digital story will help researchers who will work on similar issues in the future. For this reason, the importance of the study is that it is supportive of similar studies and provides data on the experiences of teacher candidates regarding the digital story design process.

The problem of the study was to examine the opinions of primary school mathematics teacher candidates on the digital story creation process. Answers to the following questions were sought in the scope of this problem.

1- What are the disadvantages of digital stories?
2- What is the contribution of digital stories to mathematics course?
3- What is the general evaluation of the course?

3. METHODOLOGY

3.1. Method
The study was designed as a qualitative case study. The case study focuses on a situation from a detailed and broader perspective (Thomas, 2021). This study also focused on the experiences of teacher candidates in this process, targeting to uncover these experiences with interviews.

3.2. Participants

The participants of the study were 40 primary school mathematics teaching sophomore students who received the Mathematical Association Course in the 2019-2020 Academic Year. 19 of the participants were women, and 21 were men. Taking the Information Technologies Course was determined to be a prerequisite for the participants because they need to use technology actively. The participants were divided into groups of two during this process. When they were allocated to groups, the participants were allowed to choose their own teammates. Whether the teacher candidates knew the digital story concept before was evaluated at the beginning of the process. Three of the groups said that they heard the digital story concept; however, the other groups said that they did not. It was also determined that the groups who heard about the digital story concept only knew it as a name, and did not design a digital story.

3.3. Procedure

The research was carried out within the scope of the Mathematical Association Course. The researcher was also the instructor of the course. Digital story design training was provided for 7 weeks. In the first week, the concept of digital story, its history and its use in education were explained. In the second week, the stages of designing a digital story and the components of the digital story were explained. In the third week, examples of digital stories were presented. In the fourth week, sample mathematics stories were designed in the classroom environment with all the participants. In the fifth, sixth and seventh weeks, the PowToon application to be used in digital story design was introduced and sample digital stories were designed. After seven weeks, Ministry of National Education Secondary School Mathematics Course acquisitions were distributed to the groups as a text in the study and participants were asked to create their digital stories in line with the acquisitions. The stories they created were presented in the class and were finalized with class discussions. Then, the groups were allowed to design their first digital stories by allocating time for this. The digital stories were examined and feedbacks were provided. Then, new acquisitions were given by excluding the ones used, and the groups were allowed to create their digital stories for a second time. After the completion of these digital stories, the opinions of the participants were received.

3.4. Data Collection Tools

The data of the study were collected with a semi-structured interview form that consisted of 3 questions, and which were created by scanning the literature data and receiving the opinions of two experts (Appendix 1). The first question was aimed at identifying the disadvantages of the digital story. The second question was asked to determine the contribution of digital stories to the mathematics lesson. The third question was about determining the general evaluation of the course.

3.5. Data Analysis

The Content Analysis Method, which is a research technique used to make reproducible and valid inferences from texts (or from other meaningful contexts) (Krippendorff, 2018), was used in the data analyses. Codes and categories were created with the Content Analysis Method. In order to increase the internal validity (consistency), data were checked by

returning to the data frequently during the data analysis. In addition the raw data obtained from the semi-structured interview forms were coded by the researcher and a field expert. According to Miles and Huberman (1994), the percentage of coding reliability should be above 70%. In this study, the percentage of coding reliability for the codes of the two researchers was calculated as 82%. In addition, direct quotations were included in the research.

4. FINDINGS

The findings regarding the opinions of teacher candidates on the digital story creation process were collected under 3 headings, which were "Findings on the disadvantages of digital stories", "Findings on the contribution of digital stories to mathematics course", and "Findings on the general evaluation of the course". Groups were coded as G1, G2, …, G20.

4.1. Findings on The Disadvantages of Digital Stories

The findings regarding the disadvantages of digital stories were analyzed, and 3 categories were determined. The findings are given in Table 1.

Table 1. *Codes Regarding the Disadvantages of Digital Stories*

Category	Code	Frequency (F)
Technological disadvantages		
	Supplying computer	6
	Internet problems	4
	Inability to digitize the story	3
	It can only be used where there is hardware	2
	Not being able to use technology well	1
Methodological disadvantages		
	Inability to focus on the real problem	2
	Some students learn better with traditional methods	1
	Some students learn better with concrete objects	1
	Failure in conveying the acquisitions with adequate detail	1
	Distraction of the attention from math	1
Other disadvantages		
	It is time-consuming to prepare a digital story	11
	It is tiring to prepare a digital story	1

When Table 1 is examined, it is seen that 3 categories were formed regarding the disadvantages of digital stories. It is also seen that supplying computer (f=6) and internet problems (f=4) were expressed more in the technological disadvantages category. When the methodological disadvantages are examined, it is seen that there are codes in a similar number (f=1). In this respect, inability to focus on the real problem code (f=2) is seen more. It is also seen that the most code in this problem is that the application is time-consuming in terms of preparing digital stories (f=11). Some of the explanations of different groups about the problem are given below.

> "Some students learn better with traditional ways, some students learn better with concrete objects" (G1/ Some students learn better with traditional methods, some students learn better with concrete objects).

"Many subjects are mentioned until the main subject is given to the student, and this causes waste of time. Not every student can understand that there is a problem in this story" (G10/ Inability to focus on the real problem).

"Preparing stories with an application, which requires the internet and works on a computer" (G12/ Supplying computer, internet problems).

"The disadvantage is definitely that it takes much time. Or else, we do not know that we lost a lot of time since we did not know it at first, and were not practical. However, someone who does not know digital stories, and will use them for the first time must really sacrifice time" (G15/ It is time-consuming to prepare a digital story).

"It makes the eyes tired and makes you feel tired because of working with the computer   for a long time. It takes a lot of time for us. Digital story applications do not work on the phone; and therefore, make you search for a computer" (G20/ It is tiring to prepare a digital story, it is time-consuming to prepare a digital story, supplying computer).

4.2. Findings on The Contribution of Digital Stories to Mathematics Course

When the findings on the contribution of digital stories to mathematics course were analyzed, 3 categories were identified. The findings are given in Table 2.

Table 2. *Codes Regarding the Contribution of Digital Stories to Mathematics Course*

Category	Code	Frequency (F)
Affective contribution		
	Being noticable	12
	Being visual	6
	Being enjoyable	5
	Increasing motivation	2
	Arousing curiosity	2
	Being auditory	1
	Encourage creativity	1
	Increasing the imagination	1
	Loving the lesson	1
Contribution to the process		
	Daily life-math relation	8
	Permanent learning	6
	Not being stereotyped	4
	Concretization	2
	Making learning easier	2
	Facilitating grasping	2
	Helping to understand the topic	2
	Effective teaching	1
	Latent learning	1
	Fast learning	1
	Being efficient	1
	Constructivist approach	1
Other		
	Technology use	6
	Multimedia	4
	Producing	2
	Stop and explain	1

As can be seen in Table 2, a total of 3 categories were identified regarding this study problem: "Affective contribution", "Contribution to the process", and "Other". The most frequently repeated codes in the affective contribution category were being noticable (f=12) and visual (f=6). Contributing to the process had 12 codes, mainly regarding the daily life-math relation (f=8) and permanent learning (f=6). The codes of using technology (f=6), multimedia (f=4), producing (2) and stop and explain (f=1) were identified in the "other" category. Quotations from the explanations of different groups regarding the problem are as follows:

"…The story being related to daily life, visuality" (G2/ Daily life-math relation, being visual).

"Concretizing an abstract concept, transition from real life to mathematics, being noticable, constructivist approach" (G4/Concretization, daily life-math relation, being noticable, constructivist approach).

"We showed the students that mathematics is in every part of our lives and that mathematics is not as difficult as they thought by exemplifying our story from daily life" (G10/ Daily life-math relation).

"…We think that digital stories must be involved in a digitizing world because the digital story is considered as a combination of traditional storytelling and multimedia technologies. We also think that the presentation of multimedia tools such as sounds, images, animations, videos, and music we created to present the information about a certain subject in a digital story with facts or fiction contributes greatly to the teacher and the learner" (G11/Multimedia).

"We think that if stories that are suitable for acquisitions can be formed, this will help students much. Because when the student thinks that s/he is watching something like a cartoon, s/he will have learned the subject in a moment… We also think that when students are not given examples from daily life, they may not perceive the subject completely; however, with these stories, they will have learned the subject with examples from daily life, and this will be more permanent. It will also help teachers much because when technology is involved in teaching, it can attract the attention of students helping them understand the subject" (G13/ Latent learning, daily life-math relation, permanent learning, being noticable, helping to understand the topic).

"Visual material is always better for a teacher who has practice in storytelling. Such material will always be interesting, especially for secondary school students. A teacher who knows how to create a digital story will always be able to teach his lessons in an entertaining atmosphere" (G15/ Being visual, being noticable, being enjoyable).

"Today, students see mathematics as if it consists of operations and memorization. Digital stories make mathematics teaching more fun by going beyond the monotonous subjects… As we move beyond classical teaching in this program, learning becomes more efficentfor students. Also, since this is a multimedia application, it appeals to the learning style of many students" (G16/ Being enjoyable, multimedia, being efficent).

"It provides the ability to use the computer and increases imagination as well as the permanence of knowledge" (G20 /Technology use, increasing imagination, permanent learning).

4.3. Findings on the General Evaluation of the Course

The digital story was discussed during the Mathematical Association Course. Teacher candidates were asked to make a general evaluation of the course, and positive and negative opinions were identified. The findings are given in Table 3.

Table 3. *Findings on the General Evaluation of the Course*

Category	Code	Frequency (f)
Positive	Different handling of the course	7
	Use of technology	6
	Being non-memorized	2
	Collaborative work	2
	Using imagination	1
	Combining mathematics and everyday life	1
	Changing the prejudice on math	1
Negative		
	Limited time	2
	Less practice	2

The opinions were categorized as positive and negative In the general evaluation of the course. When the positive opinions were examined, it was found that the different handling of the course (f=7) and the use of technology in the course (f=6) was among the frequently expressed codes. Also, the lesson being non-memorized (f=2), collaborative work (f=2), using imagination in the course (f=1), combining mathematics and everyday life (f=1), and changing the prejudices regarding mathematics (f=1) codes were mentioned. In negative opinions, the codes of time limitation (f=2) and less practice (f=2) were detected. Different opinions on the problem are given below:

"More practice and time was required"(G7/ Limited time, less practice).

"We experienced collobrative work. Also, we improved ourselves by doing computer work and had the opportunity to work in an application we did not know how to use, and we exchanged ideas during the story writing step" (G8/ Collaborative work, use of technology).

"This course taught students that we could make them understand some topics better by using interesting materials in different ways. It also allowed us to socialize with our   classmates. It went beyond the scientific method, adding knowledge with different methods and different applications" (G9/Collobrative work, use of technology).

"In general, the course is a fun and educational one. However, we can say that the time   was less for us to use the Powtoon Application for the first time. In other words, we had difficulty in the time given to create the story, determine the character, and understand Powtoon. However, it is a very, very ideal application for teachers who only have time to contribute something to their students. I think it has contributed to us a lot as a course. Perhaps the prejudices against mathematics will disappear with this application. At   least for mathematics teachers who use it" (G15/Limited time, changing the prejudice on math, different handling of the course).

"We could not do much practice about Powtoon Application in the classroom, which affected us negatively" (G17/ Less practice).

5. RESULTS AND DISCUSSION

Primary school mathematics teacher candidates were provided to create digital stories for the mathematics lesson with this study. At the end of the process, the opinions of the teacher candidates were received.

When the findings on the disadvantages of the digital story are examined in Table 1, it is seen that the teacher candidates saw computer and internet supply as a disadvantage. Various programs are used to create digital stories, which can often be downloaded to smartphones. However, the small size of the phone screen makes it difficult to choose objects, characters, and animations, position them, add speech bubbles to the targeted location, etc; and therefore, it is considered that it will be more beneficial to work in a computer medium. Also, since the related programs mostly work with internet support, finding an internet connection was also mentioned as another disadvantage. In programs, which work offline, it may be necessary to download from the internet again, because the objects, sound, and music employed to create stories are not adequate for the user. For this reason, internet support is needed for such studies.

The teacher candidates also said that the imagined and designed stories could not be transferred into the digital medium as they wanted as a disadvantage. The limited programs employed and the necessity of paying a fee for using more alternatives can be named as the reason for this. Also, copyright issues emerge when downloading photos, pictures, music, or sound from the internet. It is considered that copyright-free options may be insufficient in conveying the imagined elements. The use of digital stories only in places where there is hardware was also listed as a disadvantage. Various technological devices are required to use the prepared digital stories in the classroom environment. It is considered that this disadvantage can be overcome with the development of the Movement to Increase Opportunities and Improve Technology (FATIH) project in our country. Although the

prerequisite for the teacher candidates was having received the Information Technologies Course before, some teacher candidates said that they could not use technology well as a disadvantage. In their study, Walters et al. (2018) argued that teacher candidates had difficulties in using technology in the teaching process. However, they also argued that teacher candidates began to feel the advantages of technology more in time. It was mentioned in the literature that it is important for teacher candidates to have technological knowledge as well as to transfer this knowledge to the learning medium in a meaningful and accurate way (Condy et al., 2012; Heo, 2009). This study also supports the literature data. The code of not focusing on the main problem came to the forefront in the procedural disadvantages item. When the explanations were examined in this respect, it was found that the teacher candidates mentioned the dialogues in their stories in which a story was created and a solution to the problem was sought, instead of writing formulas or performing operations, which is customary in mathematics courses. However, it was determined in some of the stories created in courses that the dialogues were really extended and the time allocated for the main topic was limited. The fact that some students learn better with traditional methods and concrete objects was also expressed as a disadvantage. Özpınar (2017) also made a similar remark in his study arguing that digital stories were not suitable for every learner. Also, the fact that the acquisitions could not be explained with adequate detail in one single story was expressed as a disadvantage. It was also argued that the duration of digital stories must usually be a few minutes (Jakes & Brennan, 2005; McLennan, 2007). As a matter of fact, it was considered that it is difficult to produce content for the acquisitions that will last for one or a few weeks in the classroom medium within a few minutes. Also, the fact that technology draws attention out of the mathematics course was mentioned as another disadvantage. When the other disadvantages were evaluated, it was a striking finding that preparing digital stories is time-consuming and tiring. There are studies in the literature reporting similar results (İnan, 2015; Karataş, et all. ,2016; Özpınar, 2017).

When the findings regarding the contributions of digital stories to the mathematics course were examined, it was seen that the codes of digital stories were attractive, visual, entertaining, increasing motivation, arousing curiosity, auditory, increasing creativity and imagination and endearing the lesson (Table 2). Aydın (2019) also stated in his research that digital stories contribute to imagination and creativity. There are also studies showing that digital stories increase motivation (Sarıtepeci & Durak, 2016; Turan & Sezginsoy- Şeker, 2018). Göçen- Kabaran et al., (2019) similarly to this research, reached the conclusion that creativity and digital stories are fun. Kukul & Kara (2019) found that digital storytelling was remarkable, entertaining, aroused curiosity, and improved creativity. Another contribution of digital stories is daily life-math relation. In the special purposes of the mathematics course curriculum, it is mentioned to make sense of the relations between people and objects and the relations of objects with each other by using the meaning and language of mathematics. There is also the expression of relation in the matters that should be considered in the application of the mathematics course (MoNE, 2018). Similarly, as a result of their research, İnan (2015) and Özpınar (2017) stated that digital stories will contribute to the relationship between mathematics and daily life. Özüdogru & Çakır (2020) talked about the contributions of digital stories such as permanent learning, interest, motivation, attention. Similar

contributions were reached in this study. In the research, it was determined that another contribution of digital stories is the use of technology. In their study, Walters et al. (2016) also concluded that technology integration is an advantage of digital stories. Yıldız- Çelik (2021) concluded that digital stories positively affect information communication literacy. It was determined that teacher candidates expressed the stopping and replaying feature of digital stories as a contribution. It is thought that it is an important feature of digital stories to be in video format, to be paused where necessary during the course, to think about and to make explanations. In this way, it is thought that it can be more useful according to the learning speed of the students and the characteristics of the course.

The study was conducted within the scope of a one-semester course; and for this reason, it was considered that it might be true that the views of teacher candidates regarding the course must also be examined in evaluating the process. Positive and negative opinions were found in the general evaluation of the course (Table 3). When the positive opinions were evaluated, it was found that the course was taught differently, using technology, memorization, using imagination, combining daily life with mathematics, and changing the prejudices regarding mathematics. In the literature, there are studies on digital story design with collobrative work (Çetin, 2021; Göçen-Kabaran et all., 2019; Niemi et all., 2018;Yıldız- Çelik, 2021). It was found in the negative opinions that the time was limited and less application was made. The digital story design process with teacher candidates took place within the scope of a course that lasted for 2 hours a week. In this process, the teacher candidates were provided to design digital stories twice as well as giving theoretical information, examples, and applications. Despite this, it is considered that the fact that teacher candidates found the time and number of applications less can be associated with the fact that they faced the digital story concept for the first time, and they did not have any practice.

6. RECOMMENDATIONS

Primary school mathematics teaching was conducted with second-year students in the present study. It can be speculated that similar studies be conducted with the third or fourth-grade teacher candidates. It is considered that the fact that teacher candidates in upper grades take many education and field courses will shed light on more detailed results. The present study was based on acquisitions. It is seen in the literature that the problematic issues are determined and studies are conducted on these issues. Similarly, it is also considered that subject-based studies can be useful in solving problems. It was shown as a negation that more practice must be made in the teaching of courses. Based on this, it can be recommended that those who want to study digital stories in their classes must spend more time introducing the program(s) and make more practice.

7. ABOUT THE AUTHOR

The author works on technology-supported mathematics education, digital tools and their use in education, new orientations and approaches in mathematics education.

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Appendix / Apendices

Appendix 1

Dear teacher candidate,

We worked on the concept of digital story within the scope of the Mathematical Association Course you took during the semester. Please sincerely answer the following questions so that we can analyze the process. Thanks for your help.

Group number:

1- What do you think are the disadvantages of digital stories? Explain?

2- Do you think digital stories contribute to mathematics lessons? If your answer is yes, what kind of contributions can you make?

3- Make a general evaluation of the Mathematical Association course you took during the semester?