

Full Length Research Paper

A digital storytelling study project on mathematics course with preschool pre-service teachers

Cemil İNAN

Dicle University, Faculty of Education, Turkey.

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Digital storytelling technique is based on a presentation of course content in a story form using multimedia tools. In this study, digital stories were designed for mathematics instruction with preschool pre-service teachers. At the end of the six-week study, preschool students viewed the digital stories created. The study aimed to determine the effects of digital storytelling technique on the views of preschool pre-service teachers on the course of mathematics and the reactions of preschool students, who viewed the digital stories to the mathematics course. It was observed that pre-service teachers and preschool students considered the above-mentioned technique as interesting, funny but time-consuming.

Key words: Digital storytelling technique, mathematics course, preschool students.

INTRODUCTION

The use of storytelling approach in instructional applications dates back to earlier times. Stories have been tools preferred by teachers for they make difficult and abstract subjects to be understood. However today, in parallel to the development of technological communication tools, traditional literacy was replaced by digital literacy and traditional storytelling was replaced by digital stories (Condy et al., 2012).

Digital literacy necessitates the specialties of researching, surfing the Internet, commenting on and evaluating the content. According to Bawden (2001), digital literacy includes the efficiencies in research of information using a critical view, being aware of the significance of social media and collecting information from several sources.

Teachers utilize digital literacy to help students to read

fluently, to create multimedia texts and digital stories (Gormley and McDermott, 2013).

As the use of technology becomes increasingly significant in efficient instruction approaches, the use of techniques based on technology that enables active participation of students is becoming popular in Turkey. One of these techniques, namely the digital storytelling technique, is more popular in the western culture (Tunç and Karadağ, 2013).

Digital storytelling is the presentation of a storytelling in a specific subject using electronic media. It is telling a story about an event in computer environment using multimedia elements (audio, video, pictures, text, etc.) (Kobayashi, 2012). Digital storytelling studies make it possible to connect interdisciplinary studies such as writing, reading, drama and technology, in the category of

E-mail: cinan@dicle.edu.tr.

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project-based education (Castaneda, 2013; LaFrance and Blizzard, 2013).

Today, students could transform digital stories they record using cellular phones or cameras into videos, CDs and Poser Point presentations and share them on the Internet and express themselves (Wavro, 2012; Sawyer and Willis, 2011). Digital storytelling technique supports the development of individuals' creative, active learning, visual reading, listening, storytelling, and communications skills in the interdisciplinary context (Botturi, Bramani and Corbino, 2012; Kearney, 2011). This application also improves high level thinking paths such as reflective thinking, analytical thinking, critical and creative thinking and supports digital literacy (Nixon, 2009).

A teacher, when instructing a subject to students, should have a positive attitude towards this subject and the course being instructed. This is true for the course of mathematics as well. Teachers reflect their own experiences in mathematics and mathematical attitudes and beliefs in the mathematical strategies they would use in the future (Bailey, 2014).

One of the studies that could be performed to make students love the course of mathematics is to determine the views of pre-service teachers that would provide education on that course. It would be beneficial to prepare mathematics course materials together with pre-service teachers and evaluate pre-application results for these.

For this purpose, a project of designing digital stories that lasted for six weeks with pre-service teachers participating in this study was conducted. Digital stories designed were played for preschool students to watch. At the end of the project, the following questions were attempted to be answered:

1. What were the thoughts of pre-service teachers participated in the study on the course of mathematics at the end of the digital storytelling project?
2. What were the thoughts of preschool students that watched the digital stories designed for the course of mathematics?

METHODOLOGY

Research model

The study was created and conducted in qualitative design. In qualitative studies, qualitative data collection methods such as observation, interview and analysis of documents are used and perceptions and events are attempted to be displayed in their natural environment, and in a realist and holistic manner (Yıldırım and Şimşek, 2005).

Study group

This study was conducted in the spring semester of 2013-2014 academic year in Dicle University as a six-week long project. 25 pre-service teachers attending the junior class in the Department of

Preschool teaching participated in the study.

Development of the data collection tool

Interview forms, reports of pre-service teachers on the digital story presentations to preschool students and application videos were used as data collection tools. Interviews were conducted with pre-service teachers, who participated in the study, at Dicle University, Faculty of Education Mathematics Laboratory.

Data analysis

Initially, data provided by the researchers were transformed into written form in computer environment and then analyzed using content analysis, one of the qualitative research techniques. The answers given by pre-service teachers to each question were grouped and interpreted based on their similarities, and several responses to each questions were presented as they were.

Stages of the study

During the study, the course set by Barret (2009) and mentioned below was observed.

Barret (2009) ordered the stages of digital storytelling study as follows:

1. Writing the script of the story: The content of the subject matter is prepared.
2. Voice recording and editing: Story is verbally read and recorded.
3. Collection of the visuals: Visuals related to the story such as videos, pictures and animations are found and utilized.
4. Editing the story: Background sound, picture effects were added to the story voiceover.
5. Publishing: The completed story is published on the Internet if needed.

1st Stage: Digital storytelling technique and its production were explained to the participants.

2nd Stage: 25 pre-service teachers were divided in groups based on their preferences.

3rd Stage: Each group selected a subject matter from the preschool mathematics syllabus and created a story related to this subject matter.

4th Stage: The story was recorded by reading out loud. Its suitability for the content was inquired by the group members by listening to it several times.

5th Stage: Visuals to picture the story were prepared.

6th Stage: Story pictures, animations and sound were converted to video format.

7th Stage: Each group presented the digital story they created to the preschool students and reported and video recorded their reactions.

Analysis of the study

When the answers given by the pre-service teachers to the question; "What are your thoughts on the course of mathematics at the end of digital storytelling preparation project?" are scrutinized, the following framework could be depicted for the mathematics course instructed using digital storytelling technique:

It is a technique that improved my interest in the mathematics course but it takes a lot of time to prepare. Pre-service teachers agreed that it was effective in rebutting the bias that mathematics is

difficult to learn but it was not economical in terms of time required. The views of the junior student PT-1 in classroom teaching program were as follows:

No one can deny the importance of digital storytelling for its ability to teach the desired concept. It attracts more attention than classical instruction. Especially when young teachers and children of today pay so much attention to visual quality and technology... I cannot say it was easy for us to prepare, but I can surely say it was fun.

This technique makes it easier to relate my mathematics knowledge with the daily life. Turning any content in mathematics course into a story makes it possible to see the place of mathematics in daily life.

The views of the junior student PT-2 in classroom teaching program were as follows:

When I consider the subject in mathematics that I prepared the digital story for, my awareness on the real correlativity of mathematics course with daily life has increased.

This technique is a technique that could be fun even for a teacher who does not enjoy mathematics course. Classroom teachers are teachers who have to instruct mathematics to the students even though their field of study is not mathematics. In this field of study, it is known that certain teachers have a negative attitude for the mathematics course.

The views of the junior student PT-3 in classroom teaching program were as follows:

I never liked mathematics course, I think I will teach it with more pleasure now.

The answers by pre-service teachers to the question "What were the thoughts of preschool students that watched digital stories prepared for the mathematics course?" were as follows:

It provided a fun instruction that attracted the attention of students.

The views of the junior student PT-4 in classroom teaching program were as follows:

We have conducted the interview with the children by voice recording since we could not shoot video after the presentation. None of the children disliked storytelling. The parts they liked in the storytelling were alike. The children who said they liked math, liked the friendship of 0 and 1 the most. The children who said they did not like math liked the situation in the beginning, when 1 said he did not like 0 the most. We asked the children to count from 1 to 9. There were children who counted until 25, and there were children who did not want to count at all. However, they were overall successful. Their willingness for the interview showed that they liked digital storytelling instruction of mathematics. We liked their interest as well.

The views of the junior student PT-5 in classroom teaching program were as follows:

It was understood that instruction of mathematics in storytelling format supported by visual-technological elements made students learn the lesson better. The most important factor here was the children were not bored while learning. The concept of figures told in the digital story was formed in children aged 4-5.

The views of the junior student PT-6 in classroom teaching program were as follows:

There are individual differences between the preschool children as there are individual differences everywhere. In parallel, while the

digital storytelling example presented in the class created a positive effect on certain children, it did not succeed in certain others.

The views of the junior student PT-7 in classroom teaching program were as follows:

Within the framework of digital storytelling homework, the story named "CUTE KIKI" telling about geometric figures was designed. The main topic of the story was generosity and in parallel geometric figures and their characteristics were instructed. It was observed that children learned the geometrical concepts using digital storytelling activity with pleasure.

The views of the junior student PT-8 in classroom teaching program were as follows:

They have found the animation I designed from the beginning to the end, including all stages very impressive and they were able to focus their attention. They have listened to the story I narrated myself in the animated video ravishingly.

RESULT

The views of pre-service preschool teachers, who have prepared digital stories for mathematics instruction and presented them to preschool students, on the project were as follows:

1. Pre-service teachers stated that they found this method interesting and preschool students found it entertaining and attractive.
2. Most of the pre-service teachers stated that they liked this method, while some complained that they had difficulties. It was observed that certain pre-service teachers needed help, especially in stages that required digital literacy skills such as creating videos in digital media.
3. Most of the pre-service teachers had positive emotions when they were asked what they felt about mathematics course while they were preparing mathematics presentation in storytelling activities.
4. When the pre-service teachers were asked during their internship to compare mathematics course where digital storytelling technique is utilized with mathematics course where it is not used, they stated that they preferred instruction with digital storytelling in mathematics classes.
5. When pre-service teachers were asked if they preferred to continue to instruct mathematics classes using digital storytelling technique, most of the participants stated that they preferred to continue to instruct mathematics classes using digital storytelling technique, while a few preferred to use the technique occasionally.

SUGGESTIONS

Suggestions on the practice

- 1- Within the process, it was observed that pre-service

teachers had trouble and felt anxiety during the first weeks of the digital story design. Thus, instructional stage on digital storytelling technique could be extended.

2- During the implementation stage, pre-service teachers were allowed to form study groups as they preferred. However, within the process it was observed that some groups were homogenous and did not contain individuals with different skills necessary for different stages of the process and the groups often requested advice for that reason. Thus, it is necessary to form heterogeneous study groups.

Suggestions for further studies

1- This study was limited to pre-service teachers and preschool students. Related technique could be applied to pre-service teachers in different fields of study and students in different grades.

2- In the study, the views of pre-service teachers were obtained using a qualitative method. In similar studies, the effects of digital storytelling technique on the attitudes on mathematics course could be investigated.

3- In the study data were collected using interviews, examination of reports and video recordings. Similar studies could utilize different tools of evaluation.

Conflict of Interests

The author has not declared any conflict of interests.

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