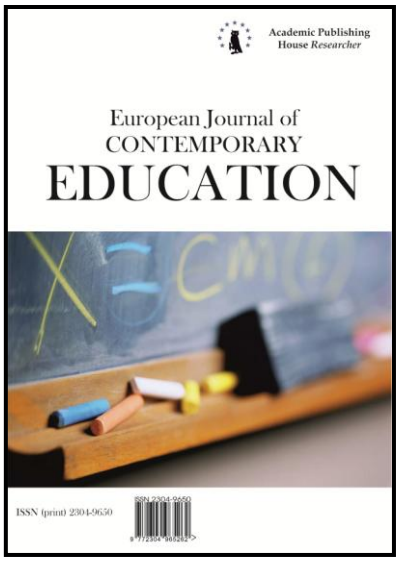
Published in the Russian Federation
European Journal of Contemporary Education
ISSN 2219-8229
E-ISSN 2224-0136
Vol. 15, Is. 1, pp. 51-64, 2016
DOI: 10.13187/ejced.2016.15.51
www.ejournal1.com



The Investigation of Preservice Teachers' and Primary School Students' Views about Online Digital Storytelling

Ferit Karakoyun [a, *], Abdullah Kuzu [b]

[a] Dicle University, Turkey
[b] Anadolu University, Turkey

Abstract

This study was aimed at investigating the views held by preservice teachers from the department of Computer Education and Instructional Technology (CEIT) and those of 6th grade students about the process of online digital storytelling activities as it applies to the students' education. The study was designed as a case study. The data were collected through direct observations, semi-structured interviews and surveys. The participants of the study were eight senior preservice teachers from CEIT and 47 6th grade students from Eskisehir Cagdas Private Elementary School. The study followed two stages. In the first stage, the preservice teachers from CEIT were trained in online digital storytelling; and in the second stage, the preservice teachers performed online digital storytelling activities with 6th grade students. According to the findings obtained in the study, the preservice teachers thought that carrying out digital storytelling activities in an online environment engages students' attention, accelerates the digital storytelling process, increases communication between students and contributes to the development of students' digital stories. In addition, both the preservice teachers and the elementary school students agreed that digital storytelling developed the students' 21st century skills. On the other hand, the preservice teachers complained about the fact that digital storytelling activities lasted for a long period of time; that the students were reluctant to participate; and that the students copied their scenarios from the Internet; meanwhile, the students mostly complained about technical problems, about the lack of sufficient sources related to the their stories and about the extended time-taking aspect of the activity process.

Keywords: Digital Storytelling, 21st century skills, technology integration, Web 2.0, distance learning.

[*] Submitted the manuscript on November 12, 2015.
E-mail addresses: ferit.karakoyun@dicle.edu.tr (Ferit Karakoyun), akuzu@anadolu.edu.tr (Abdullah Kuzu)

Introduction

Advances in technology have influenced many environments and individuals. One of the most important environments influenced by technology is the educational environment because preparing students for real life as individuals capable of using technology is one of the requirements of an educational environment. In order for technology to be used effectively in an educational environment, it is essential that technology be integrated into educational curricula (Bitner & Bitner, 2002). The integration of technology into educational curricula requires the use of technology as a tool to teach the educational content effectively (Harris, 2005). Earl (2002) stated that the integration of technology is not related to the amount or type of technology but to why and how technology is used. In this respect, technology should focus on the content of the curricula and learning.

There are many of approaches in which technology is integrated into teaching and learning. One of these approaches, digital storytelling, has recently gained more popularity among educational environments (Ware, 2006).

Digital Storytelling

When the literature on digital storytelling is reviewed, a great number of definitions emerge. According to Dreon, Kerper and Landis (2011), digital storytelling refers to delivering storytelling art with the support of technological tools. Another researcher, Robin (2006), however, defines it as the relationships between such multimedia elements as text, graphics, audio, video and music in order to provide information on a specific topic. Robin and Pierson (2005) define digital storytelling as creating meaningful stories that address students' and teachers' imaginations and increase their related experiences. Generally speaking, digital storytelling combines multimedia technologies and content, establishing an emotional connection with the content, and allows for sharing the content with others (Moseley, Gdovin, & Jones, 2013).

While creating digital stories, students generally should adopt a study process that includes the students' determining a topic, conducting research on that topic, using technological tools, relating multimedia elements to each other and eventually creating a short video (Kajder & Swenson, 2004). Digital stories may vary in length yet last only a few minutes (Robin, 2008).

Digital Storytelling and Web 2.0

In general, Web 2.0 technologies are defined as the second-generation web which provides users with the opportunity to share their knowledge and thoughts, thereby increasing access to various online applications and sources, and allowing for cooperation between individuals in the Internet environment (Cormode & Krishnamurthy, 2008; Mcloughlin & Lee, 2007). Smeda, Dakich and Sharda (2010) stated that Web 2.0 technologies allow for the sharing of information between individuals and developing the cooperation between them; additionally, these technologies create a participatory environment which supports multimedia learning.

Web 2.0 provides users with access to Web 2.0 tools that enable users to create, edit and broadcast content (Alexander & Levine, 2008). This feature provides an ideal platform for interactive educational environments such as digital storytelling (Safran, Helic, & Gütl, 2007). Alexander and Levine (2008) define online software utilized for using and combining multimedia resources and sharing digital stories as 'Web 2.0 storytelling'. It was observed in situations involving the use of Web 2.0 technologies that students were more enthusiastic; that student participation increased; and that students were more willing to express themselves and to communicate with their peers (Shih, 2010).

Digital Storytelling in Education

Digital storytelling brings about a number of positive features thanks to the traditional storytelling method in educational environments: Students take active roles in the digital storytelling process; and they can develop their oral and writing skills and use technology effectively (Kocaman-Karaoğlu, 2014; Ohler, 2013). Also, digital storytelling increases students' motivation for learning and allows for personalization of the learning experiences and understanding of the expectations regarding the instructional process (Hung, Hwang, & Huang, 2012; Ohler, 2013; Ware, 2006). In addition, digital storytelling can clarify concepts that are

difficult to understand in the classroom environment and also facilitate discussions regarding these subjects (Ohler, 2013).

Activities carried out in the digital storytelling process in a classroom environment transform passive students into active participants of the learning process (Howell & Howell, 2003). These activities allow students to become narrators, authors, actors and producers. In addition, thanks to digital storytelling, students ask questions of themselves such as 'Why am I telling this story?', 'What is the purpose of the study?' or 'Where am I in this story?'; thus, digital storytelling can be regarded as a strong learning tool that helps students personalize their learning experience (Jakes & Brennan, 2005; Salpeter, 2005).

In the digital storytelling process, students thinking about telling a personal story have a number of opportunities to have the story formulate an original dimension. These opportunities allow students to express themselves, to develop an understanding of humour and to shape the instructional process align with their new needs (Hull, 2003; Sarıca & Usluel, 2016). Sadik (2008) states that digital storytelling encourages students to share their knowledge and to express their thoughts. Also, in the digital storytelling process, students can criticize not only their own studies but also others' studies by sharing their stories. This could contribute to the development of students' emotional intelligence and of their social learning (Robin, 2008). In addition, digital storytelling could also contribute to the development of students' technological skills in the 21st century.

Digital Storytelling and 21st Century Skills

Over the last decade, new skills and competencies necessary to prepare students for business environments as well as for life in the digital era constitute the focus of both the education world and the business world (Lemke, Coughlin, Thadani, & Martin, 2007). It is seen that most of these skills and competencies have a relationship with the digital environment and with information management which covers the selection of information, its integration, analysis and sharing (Ananiadou & Claro, 2009). When the related literature is examined, it is understood that these skills focusing on the digital environment are generally referred to as 21st century skills and competencies (Ananiadou & Claro, 2009; Jakes, 2006).

The researchers in 'Partnership for 21st Century Skills' published a report on the skills that students must possess in the 21st century and categorized these skills as 'learning and innovation skills', 'information, media and technology skills', and 'life and career skills' (Partnership for 21st Century Skills, 2003). It is seen that digital storytelling helps students develop these skills. Robin (2008) stated that thanks to the digital storytelling approach, students could improve their digital, technological, visual and information literacy. The digital storytelling process contributes to the development of students' 21st century skills since it requires them to research, synthesize information, to be creative and to think critically (Hull & Katz, 2006; Husband, 2014; Ohler, 2008; Yang & Wu, 2012; Yuksel, Robin & Mcneil, 2011; Ware, 2006). In addition, as they use technology in the digital storytelling process, students develop their problem solving skills (Bull & Kajder, 2004; Czarnecki 2009; Gaeta et al, 2014; Ming, 2014; Ramble & Mlambo, 2014; Robin, 2008). The traditional storytelling method allows for problem solving within the structure of the story, while digital storytelling enhances these opportunities by combining the traditional storytelling method with the digital environment (Miller, 2009). In general, the process of creating digital stories forms a strong sub-structure for the development of students' skills called 21st century literacy or 21st century skills (Brown, Bryan, & Brown, 2005; Robin, 2008; Partnership for 21st Century Skills, 2003). In this respect, digital storytelling can equip students with the skills required to meet the demands of society in the 21st century (Jakes & Brennan, 2005).

It is crucial that technology merges with educational curricula and strategies within the framework of educational standards and helps students develop skills that meet the expectations of the society and of the business world. For this reason, it does matter how technology is used in the classroom for the development of students' 21st century skills, which, in other words, means that information and communication technologies should be used effectively in class to help students achieve meaningful learning, to structure their knowledge and to develop their 21st century skills.

Taking the above-mentioned into consideration, the aim of this study was to investigate the views of preservice teachers from the department of Computer Education and Instructional

Technology (CEIT) and those of elementary school 6th grade students who are in the process of formulating online digital storytelling activities.

For this purpose, the following research questions were directed in the study:

1. What are the views of preservice teachers and students about the effects of online digital storytelling activities on the development of 21st century skills?
2. What are the views of preservice teachers and students about the advantages of online digital storytelling activities?
3. What are the views of preservice teachers and students about the limitations of online digital storytelling activities?
4. What are the students' and preservice teachers' suggestions regarding the online digital storytelling activities?

Method

Research Model

The study followed two stages. In the first stage, the senior preservice teachers from the department of Computer Education and Instructional Technology were trained in online digital storytelling; in the second stage, the preservice teachers performed online digital storytelling activities with 6th grade students within the scope of the course of 'Teaching Practice' in the Spring Term of 2012–2013. The second stage of the study was designed as a case study.

Participants

The participants of the study were eight senior students from the department of Computer Education and Instructional Technology at Anadolu University in the Spring Term of 2012–2013 and 47 6th grade students from Eskisehir Cagdas Private Primary School. The participants were selected with the purposeful sampling method.

Data Collection Tools

The research data were collected via direct observations, semi-structured interviews and the 21st Century Skills survey regarding digital storytelling activities.

The 21st century skills survey regarding digital storytelling activities

Before the survey items were formed, the related literature was reviewed. Following this, a survey questionnaire including 41 items was created to determine the effects of the activities implemented within the framework of indicators of 'Partnership 21st Century Skills' as to the development of 21st century skills. The survey was composed of three sub-categories identified as 'learning and innovation skills', 'information, media and technology skills' and 'life and career skills'.

The Research Process

The study was carried out in two stages: the preparation stage and the implementation stage.

The preparation stage: Before the implementation stage of the research, the video editing software with which the students could engage in the digital storytelling activities online was determined. For this reason, the researcher searched for and examined a variety of video editing and digital storytelling web pages in order for students to create digital stories online and found that some of these web pages were too complex and some did not include the features that were suitable for the purpose of the research.

However, after a considerable amount of research, 'Wevideo', which is online video editing software, was selected to be used for the study since it had a straightforward interface, cloud technology and effective features. In addition, Wevideo is used in digital storytelling workshops by the 'Center of Digital Storytelling (CDS)' at Houston University. Figure 1 depicts a screenshot of Wevideo:

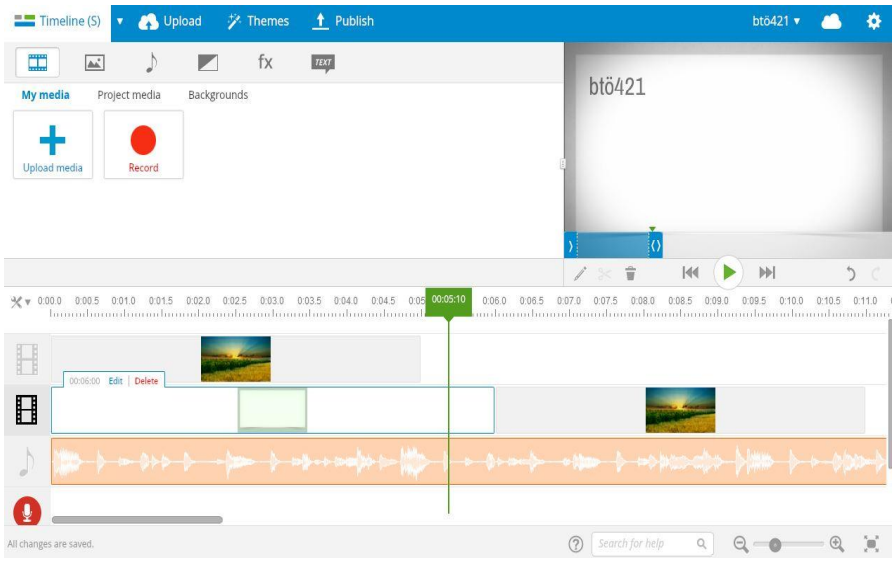


Figure 1. Wevideo screenshot

Next, a new webpage called 'Digital Storytelling Webpage (*www.digitaloykuleme.com*)' was created so the students could perform online digital storytelling activities and communicate with each other about their activities. This webpage was designed to complete the missing aspects of the online software 'Wevideo'. The 'Digital Storytelling Webpage' was used for the steps of the digital storytelling process, which included developing a scenario, getting feedback, creating a storyboard and sharing digital stories. The webpage had a menu bar of four hyperlinks: home page, scenario, storyboard and video, which are described below:

Home page: This page included announcements regarding the students.

Scenario: On this page, the students created their scenario drafts and received feedback from other students.

Storyboard: On this page, the students edited the storyboards of their scenarios that they had created previously.

Video: On this page, the students created their digital stories with the help of Wevideo, shared them on YouTube and then included links to the digital stories they shared on YouTube.

Figure 2 presents a screenshot of the scenario page of the Digital Storytelling Webpage.

Figure 2. Digital Storytelling webpage screenshot

Finally, before the implementation stage, the literature on digital storytelling was reviewed, and a training program was prepared on digital storytelling. Then, the eight senior students from the department of Computer Education and Instructional Technology were trained on digital storytelling and its software use for a total of 10 hours over the course of 4 weeks. After the training, the preservice teachers created their digital stories and shared them online.

The implementation stage: The implementation stage of the study was done between 04.03.2013 and 17.05.2013 with the 6th grade students at Eskisehir Cagdas Private Primary School who partook in a non-credit course covering information technologies. The digital storytelling activities were performed with 47 students in total from three different classrooms. The implementation stage lasted 10 weeks, and encompassed one hour a week for each classroom.

First, the students were provided with training on digital storytelling, Wevideo and use of the digital storytelling webpage. After the training, the students determined the topics for their digital stories and added their scenario drafts to the Digital Storytelling Webpage. Having created their scenario drafts, the students received feedback (comments) from the preservice teachers as well as from their peers through the webpage. Then, the students edited their scenarios on the webpage in accordance with the feedback and finalized them.

Next, the students narrated their own scenarios and researched multimedia materials to use with their scenarios on the Internet and from other media. Following this vocalization process, the students created their storyboards by relating the multimedia materials they had found to their scenarios and added them to the digital storytelling webpage. After that, the students edited the multimedia materials via Wevideo, the video editing software. Lastly, having finalized their digital stories, the students shared their videos with their peers on YouTube and the digital storytelling webpage.

Data Analysis

The qualitative data obtained from the study were analyzed with the content analysis method. In addition, the quantitative data obtained from the survey were analyzed with SPPS 20.0 software, and descriptive statistics for the items in the questionnaire were applied.

Findings

According to the findings obtained in this study, 45 6th grade students created digital stories; however, two students were unable to complete their stories. It was also revealed that out of the digital stories created, 42 were informative (introductory) and the remaining 3 were personal (reflective). The informative stories were videos that mainly included interesting information (27), the life stories of celebrities (10) and the development of technology (5).

Findings Regarding the Effects of Digital Storytelling on the Development of 21st Century Skills

Findings obtained from the students: Table 1 shows the findings regarding the data obtained from the 'Survey on 21st century skills regarding digital storytelling activities' applied to the students.

Table 1. Descriptive statistics for the values regarding the 21st century skills survey

	n	$\bar{X}$	SS
Learning and Innovation skills	45	3,55	,830
Information, Media and Technology skills	45	3,84	,791
Life and Career skills	45	3,57	,881
General average	45	3,61	,791

As can be seen in Table 1, the mean scores for each indicator were considerably above the mean value of 3, which demonstrated that the 6th grade students believed digital storytelling activities improved their skills in 'learning and innovation', 'information, media and technology' and 'life and career'. When the data in Table 1 are examined, it can be seen that 'information, media, and technology skills' had the highest mean, while 'learning and innovation skills' had the lowest. Taking the general average into account, it can be suggested that the students thought digital storytelling activities improved their 21st century skills ($\bar{X}$ = 3,61).

Findings obtained from the preservice teachers: Table 2 shows the preservice teachers' views about the effects of digital storytelling activities on the development of the students' 21st century skills.

Table 2. Themes related to the 21st century skills

21st Century Skills		
Learning and Innovation	Information, Media and Technology	Life and Career
Critical Thinking and Problem Solving	Information and Communication Technologies literacy	Flexibility and Adaptability
Creativity and Innovation	Information literacy	Social and Cross-Cultural skills
Communication and Collaboration	Media literacy	Responsibility Productivity

Learning and innovation skills. As can be seen in Table 2, the preservice teachers' views about the effects of digital storytelling activities on the development of the students' learning and innovation skills included such dimensions as 'critical thinking and problem solving', 'creativity and innovation' and 'communication and collaboration'.

The preservice teachers believed that the students' critical thinking skills were improved since it was possible for the students to make comments on each other's scenarios and to edit their scenarios accordingly; likewise, the fact that they solved the problems they encountered while creating their digital stories improved their problem solving skills. One of the preservice teachers, A.S., said:

> *A.S.: 'The students made critical comments on their peers or their scenarios. And this could have improved their critical thinking skills'.*

Some preservice teachers thought that students' creativity and innovation skills were developed during the process due to the fact that the students created a product from their own perspectives and learned new information about the topics they researched and about the videos their peers created. G.B.'s remarks were as follows:

> *G.B.: 'The students created a product by combining their previous knowledge with the new information they obtained, and we asked them to create the product from their points of views. This developed their creativity skills'.*

However, some other preservice teachers belonging to the study group stated that the fact that the students made comments on each other's scenarios through the digital storytelling webpage was a step that improved their communication skills, while the fact that they helped each other during the digital storytelling process was another step that improved their collaboration skills. The comments of one of the preservice teachers, F.S., were as follows:

> *F.S.: 'Since the students made comments on each other, their communication skills improved. In other words, they improved their communication skills as they commented on each other's scenarios'.*

Information, media and technology skills. As shown in Table 2, the preservice teachers' views about the effects of digital storytelling activities on the development of the students' information, media and technology skills included such dimensions as 'information and communication technologies literacy', 'information literacy' and 'media literacy'.

According to the preservice teachers, the fact that the students used Wevideo to edit their digital stories, uploaded their scenarios online and made comments on each other's projects could have improved the students' information and communication technologies literacy. One of the preservice teachers, A.S., reported as follows:

A.S.:'I think the students learned to use Wevideo software basically and to create a video'.

Some of the preservice teachers thought that the students' information literacy was improved by completing the process since the students made information choices, related a variety of information to each other and made decisions on which information to use and whether the information they obtained was correct or not. One of the preservice teachers, Y.O., said:

Y.O.: 'The students did research about the topics. They related the information they found to each other. They evaluated the information in terms of two aspects: which information to use and which information was more accurate. I think all these improved their information literacy skills'.

On other hand, according to some other preservice teachers, the fact that during the digital storytelling process the students edited the multimedia materials by using online video editing software, vocalized their stories and then streamed the videos they created over the Internet might have improved their media literacy. One of the preservice teachers, G.B., reported as follows:

G.B.: 'The students did sound recordings, for example – how is sound recorded? Some students learned how to do it. This is related to media literacy. For example, the students' creating their videos and sharing them online can count in media literacy'.

Life and career skills. As can be seen in Table 2, the preservice teachers mainly believed that digital storytelling activities improved the students' skills regarding 'flexibility and adaptability', 'social and cross-cultural skills', 'responsibility' and 'productivity'.

The preservice teachers not only thought that the students improved their 'flexibility and adaptability' because the students adapted themselves to specific tasks during the process and were flexible while making comments on each other's scenarios and but the teachers also believed that the students improved their 'social and cross-cultural skills' because they expressed themselves and maintained in-class communication. Furthermore, the preservice teachers added that the students' 'responsibility' improved since completing specific tasks in order was required during the digital storytelling process and that their 'productivity' improved as they created a final product. One of the preservice teachers, S.K., reported as follows:

S.K.: 'It could be that the students adapted to specific tasks and were flexible about the comments made. During this storytelling procedure, editing the pictures depending on vocalization, for example, or other similar things can improve the students' adaptability skills'.

Findings Regarding the Advantages of Digital Storytelling

The preservice teachers reported that the online environment intrigued the students and accelerated the process of digital storytelling. In addition, they believed that since the online environment allowed the students to comment on each other's scenarios and to perform the activities more easily, the communication between the students and the development of the students' products were improved. The remarks of one of the preservice teacher, B.Y, were as follows:

B.Y.: 'Students like to go online. As they are always online, it was a plus that this program was online, too, together with the fact that they can make comments through our webpage. It might not have been so appealing if it hadn't been online or if we'd had them create the stories with Movie Maker'.

Findings Regarding the Limitations of Digital Storytelling

Table 3 shows the problems that the participants of this study encountered during the digital storytelling process.

Table 3. Problems the participants encountered during the digital storytelling process

Problems Encountered	
Students' views	**Preservice teachers' views**
Use of Wevideo	Lack of time
Insufficient resources	Lengthy implementation stage
Lengthy implementation stage	Reluctant students
	Scenarios copied from the Internet

As can be seen in Table 3, the problems that the students encountered during the storytelling process included the use of Wevideo, insufficient resources and the lengthy implementation stage.

The students indicated they had trouble using Wevideo; that the implementation stage lasted too long; and that a lot of time was wasted during this stage. One of the students, Z.G., commented as follows:

Z.G.:'It took so long. It was for 10 weeks and exhausting. I think we wasted a lot of time'.

As shown in Table 3, the problems that the preservice teachers encountered during the storytelling process included lack of time, the lengthy implementation stage, reluctant students and scenarios copied from the Internet.

In particular, the preservice teachers stated that there was not enough time to perform all of the scheduled activities since the weekly class time allocated for the information technology course was only one hour and that the implementation stage took so long. One of the preservice teachers, B.Y.'s, said:

B.Y.:'Perhaps it would have been wiser to implement the activities in courses where the allocated weekly class hours for the course were 2-3 hours. Or maybe if there had been another course or if they had been implemented for 3-4 hours a week, it would have finished in 3 weeks, and it would have been more fun – without long interruptions at least'.

Some preservice teachers pointed out that the students were reluctant to perform the activities. One preservice teacher, S.K., said:

S.K.:'The biggest problem I had during the process was, I guess, that they were a bit demotivated and unwilling. There were a couple of students that really bothered me. I was completely tired of asking them to do the activities'.

Some otherpreservice teachers, on the other hand, stated that the students copied and pasted information from the Internet at the beginning of scenario writing; that they were not able to compile the information obtained and showed a lack of originality in their scenarios. One of the preservice teachers, G.B., reported as follows:

G.B.:'One of the biggest problems was that some students copied and pasted their scenarios. For us, it is to make students write scenarios that was itself a huge problem. And some students copied and pasted the scenarios'.

Findings Regarding the Suggestions on Digital Storytelling

It was found that the students had varied viewpoints about group work during the digital storytelling activities. Some students stated that more comprehensive products could be created with group work, while some others believed that less comprehensive products could be created with group work. One of the students, E.B., said:

E.B.:'It would have been better if we were divided into groups – not individually. Each of us could have researched a different thing, I mean, about the same thing more research could be done in detail, so I think group work might have been better'.

With regards to the digital storytelling activities performed in the course of information technologies, the preservice teachers' suggestions were to increase the weekly class hours allocated, to create personal stories and to prepare multidisciplinary activities. The preservice teachers mainly expressed that the number of weekly class hours allocated should be increased as the implementation stage took so long. Moreover, they suggested that students create personal stories and that activities be multidisciplinary as a solution to problems such as students' lack of motivation and copying of scenarios. One preservice teacher, S.K., stated:

S.K.:'Actually, we could have done more effective things during the implementation stage if there had been more weekly course hours allocated'.

The preservice teachers stated that digital storytelling was compatible with the information technology course since it helped the students increase their content knowledge and developed their technology skills. The preservice teachers added that in their future educational instructions, they would possibly use digital storytelling to teach software use and other specific subjects. The preservice teachers believed that the digital storytelling activities were appropriate to teach particularly computer hardware and technology development. One of the preservice teachers, G.B., said:

G.B.:'I don't really think digital storytelling can be widely used while teaching Office programs or Photoshop programs, but I think it can be quite useful while teaching hardware topics, hardware pieces or the historical development of the computer'.

In addition, both the preservice teachers and the students thought that digital storytelling activities might be appropriate applications for science, social studies and Turkish language courses.

Discussion and Conclusion

It can be stated that performing digital activities online attracted the students' attention, enhanced communication among the students and contributed to the students' products as they facilitated task achievement. According to Shih (2010), web-supported learning environments allow students to give feedback and evaluate each other. Furthermore, Shih (2010) used Web 2.0 technology in his research and stated that Web 2.0 technology enhanced the students' communication skills and increased their enthusiasm and participation. Similarly, Behmer (2005) pointed out that the digital storytelling process provides the opportunity to use communication and technology tools allowing students to work collaboratively and to examine a variety of topics critically.

The participants of this study believed that the digital storytelling activities improved learning and innovation skills. The communication among the students while creating digital stories and the comments and evaluations on each other's digital stories promoted the students' critical thinking skills (Yang & Wu, 2012). Jenkins and Londsdale (2007) reported that digital storytelling activities help students solve problems innovatively and boost their creativity. In addition, Sadik (2008) stated that teachers believe digital storytelling improves students' communication and collaboration skills in long-term projects.

The participants also stated that digital storytelling activities improved information, media and technology skills. Tendero (2006) stated that digital storytelling is basically a process in which students can use technology as designers; that students interpret their opinions parallel to their own experiences during this process; and that they create their own narrative languages while interpreting their opinions through technological facilities. According to Barret and Wilkerson (2004), digital storytelling causes students to be more successful in using, restructuring, relating and interpreting the knowledge they obtain during the learning process than other students. In addition, students improve their technology skills by using certain computer software and

technological tools while restructuring the knowledge during the digital storytelling process (Robin, 2008; Yuksel, Robin, & McNeil, 2011). Robin (2008) states that information literacy, visual literacy and media literacy can all be enhanced on the condition that student involvement in the digital storytelling process is achieved. According to Dogan (2012), students think that digital storytelling promotes technology skills and media literacy skills the most.

The participants also thought that life and career skills, which are among the 21st century skills, developed thanks to digital storytelling activities. In this respect, Yuksel, Robin and McNeil (2011) stated that during the storytelling process, students improve such life-related skills as a sense of community, empathy, collaboration, social interaction and communication skills. Besides this, it is seen that students develop a sense of responsibility over time for the activities during the digital storytelling process (Tatum, 2009). Daigle (2008) carried out research on digital storytelling in special education and concluded that digital storytelling promotes students' literacy and social skills. Likewise, Jakes (2006) categorized the 21st century skills as digital age literacy, creative thinking, effective communication and high level of productivity and reported that digital storytelling helps students acquire all these skills.

The preservice teachers generally stated that there was not enough time to perform the activities scheduled since the weekly class time allocated for the information technology course was only one hour a week and that the implementation stage lasted too long. Additionally, they thought that the number of weekly class hours for the information technology course should be increased due to the fact that the implementation stage took so much time. In this respect, it could be stated that lack of time prevented performing the activities as scheduled, which resulted in the lengthy implementation stage as well. Reviewing the literature, it can easily be found out that one of the biggest issues with technology integration is shortage of time. With respect to this, Robin (2006) stated that gathering all of the components required in digital storytelling and creating a story is a long process that needs a considerable amount of time. According to Cuban (2011), among the obstacles to technology integration at schools are shortage of time and insufficient technical support. To conclude, students need more time during the digital storytelling process so as to learn how to use the software and to do research on the topics determined (Gakhar, 2007).

Another obstacle encountered in the research process was that the students were mostly reluctant and demotivated to engage in the process. The preservice teachers expressed that the students were mostly reluctant to do the activities at the implementation stage. The fact that the information technology course was a non-credit one might have caused the students to act unwillingly. Additionally, it was discovered that many of the students copied their scenarios from the Internet. In this respect, it can be concluded that lack of enthusiasm in participating in the activities resulted in copying the scenarios.

When the suggestions regarding the activities are taken into consideration, it is seen that elementary school students have different points of views about whether the activities should be performed in groups. With respect to this, Jakes and Brennan (2005) state that the digital storytelling process is indeed a personal process rather than a collaborative one. Similarly, Sadik (2008) states that students do not tend to work in groups and that those who work in groups have trouble reflecting upon each other's thoughts and opinions.

The participants of this study also agreed that digital storytelling activities are particularly appropriate to science, social studies and Turkish language courses. In one study, Gakhar (2007) stated that the students considered digital storytelling a useful learning tool and would like to benefit from it in such courses as history, science, mathematics and verbal communication. Dupain and Maguire (2005) underline the fact that teachers can make use of digital storytelling activities in such various areas as reading, writing and science.

All of the preservice teachers stated that digital storytelling activities were appropriate to the course of information technologies and that they were planning to use them in their future educational instructions. In their study, Dogan and Robin (2008) conducted digital storytelling activities with elementary school teachers and stated that all of the participants expressed the idea of using digital storytelling activities in their classrooms in the future.

References

1. Alexander, B., & Levine, A. (2008). Web 2.0 storytelling. Emergence of a new genre. *EduCAUSE Review, 43*(6), 40–56.
2. Ananiadou, K., & Claro, M. (2009). *21st century skills competences for new millennium learners in OECD countries*. (OECD Education Working Papers, No. 41), Paris: OECD Publishing.
3. Barrett, H., & Wilkerson, J. (2004). Conflicting paradigms in electronic portfolio approaches. Retrieved from http://electronicportfolios.com/systems/paradigms.html.
4. Behmer, S. (2005). Digital storytelling: Examining the process with middle school students. *Proceedings of Society for Information Technology & Teacher Education International Conference* (1), 822-827.
5. Brown, J., Bryan, J., & Brown, T. (2005). Twenty- first century literacy and technology in K–8 classrooms. *Innovate, 1*(3). 1.
6. Bitner, N., & Bitner, J. (2002). Integrating technology into the classroom: Eight keys to success. *Journal of Technology and Teacher Education, 10*(1), 95-100.
7. Bull, G., & Kajder, S. (2004). Digital storytelling in the language arts classroom. *Learning & Leading with Technology, 32* (4), 46-49.
8. Cuban, L. (2001). *Oversold and underused: computers in the classroom*. Harvard University Press: Cambridge.
9. Cormode, G., & Krishnamurthy, B. (2008). Key differences between Web 1.0 and Web 2.0. *First Monday*, *13*(6), 2.
10. Czarnecki, K. (2009). Digital storytelling in practice: Storytelling in context. *Library Technology Reports, 45*(7), 5-8.
11. Daigle, B. A. (2008). *Digital storytelling as a literacy-based intervention for a sixth grade student with Autism Spectrum Disorder: An exploratory case study* (Unpublished doctoral dissertation). Baton Rouge, La: Louisiana State University. Retrieved from http://etd.lsu.edu/docs/available/etd-11122008-074526/unrestricted/Daigle_diss.pdf
12. Dogan, B., & Robin, B. (2008). Implementation of Digital Storytelling in the Classroom by TeachersTrained in a Digital Storytelling Workshop. In K. McFerrin et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2008* (pp. 902-907). Chesapeake, VA: AACE.
13. Dogan, B. (2012). Educational uses of digital storytelling in K-12: Research results of digital storytelling contest (DISTCO) 2012. In P. Resta (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2012* (pp.1353–1362). Chesapeake, VA: AACE.
14. Dreon, O., Kerper, R.M., & Landis, J. (2011). Digital storytelling: A tool for teaching and learning in the YouTube generation. *Middle School Journal, 42*(5), 4-9.
15. Dupain, M., & Maguire, L. (2005). *Digital story book projects 101: How to create and implement digital storytelling into your curriculum*. Paper presented at the 21st Annual Conference on Distance Teaching and Learning, August 3-5, Wisconsin, United States. Retrieved May 2012 from http://www.uwex.edudisted/conference.
16. Earle, R.S. (2002). The integration of instructional technology into public education: Promises and challenges. *ET Magazine, 42*(1), 5–13.
17. Gaeta, M., Loia, V., Mangione, G. R., Orciuoli, F., Ritrovato, P., & Salerno, S. (2014). A methodology and an authoring tool for creating Complex Learning Objects to support interactive storytelling. *Computers in Human Behavior, 31,* 620–637.
18. Gakhar, S. (2007).The influence of digital storytelling experience on pre-service teacher education students' attitudes and intentions, *Masters Abstracts International, 46*(1).
19. Harris, J. (2005). Our agenda for technology integration: It's time to choose. *Contemporary Issues in Technology and Teacher Education*, *5*(2), 116–122.
20. Howell & Howell (2003).What is your digital story? *Library Media Connection, 22*(2), 40.
21. Hull, G. A. (2003). Youth culture and digital media: New literacies for new times. *Research in the Teaching of English, 38* (2), 229-233.
22. Hull, G. A., & Katz, M. L. (2006). Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English, 41* (1), 43-81.

23. Hung, C.-M., Hwang, G.-J., & Huang, I. (2012). A Project-based Digital Storytelling Approach for Improving Students' Learning Motivation, Problem-Solving Competence and Learning Achievement. *Journal of Educational Technology & Society, 15*(4), 368–379.

24. Husband, T. (2014). Developing 21st century skills in teacher education through digital storytelling*, Gauisus,* 2. Retrieved from http://gauisus.weebly.com/husband-teacher-education-skils-though-digital-storytelling.html

25. Jakes, D. (2006). Standards-Proof your digital storytelling efforts. Retrieved from *TechLearning:* http://www.techlearning.com/story/showArticle.ihtml?articleID=180204072.

26. Jakes, D.S., & Brennan, J. (2005). Capturing stories, capturing lives: An introduction to digital storytelling. Retrieved from http://bookstoread.com/etp/earle.pdf.

27. Jenkins, M., & J. Lonsdale. (2007). Evaluating the effectiveness of digital storytelling for student reflection. *ASCILITE conference* (pp.440–444). Singapore.

28. Kajder, S. B., & Swenson, J.A. (2004). Digital Images in the Language Arts Classroom [Electronic version]. *Learning and Leading with Technology, 31*(8), 18-19, 21, 46.

29. Kocaman-Karoglu, A. (2014). Personal Voices in Higher Education: A Digital Storytelling Experience for Pre-Service Teachers. *Journal of Education and Information Technologies, (Online First, December, 2014). (DOI: 10.1007/s10639-014-9373-1)*

30. Lemke, C., Coughlin, E., Thadani, V., & Martin, C. (2007). enGauge 21st century skills: Literacy in the digital age. Retrieved from http://pict.sdsu.edu/engauge21st.pdf

31. McLoughlin, C., & Lee, M. J. W. (2007). Social software and participatory learning: pedagogical choices with technology affordances in the Web 2.0 era. *Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) Annual Conference* (pp.664-675), Singapore.

32. Miller, E. A. (2009). *Digital storytelling* (Unpublished master dissertation). University of Northern Iowa, USA. Retrieved from http://www.uni.edu/icss/researchhelps/miller.pdf

33. Ming, T.S., Sim, L.T, Mahmud, N., Kee, L.L., Zabidi, N.A., & Ismail, K. (2014). Enhancing 21st century learning skills via digital storytelling: Voices of Malaysian teachers and undergraduates. *Procedia-Social and Behavioral Sciences, 118,* 489–494

34. Moseley, C., Gdovin, R., & Jones, K. (2013). Exploring mental models of science teachers using digital storytelling. *Electronic Journal of Science Education, 17*(1), 1–20.

35. Ohler, J. (2013). *Digital storytelling in the classroom. New media pathways to literacy, learning, and creativity (2nd ed.)*. Thousand Oaks, CA: Corwin Press.

36. Partnership for 21st Century Skills. (2003*). Learning for the 21st century: A report and mile guide for 21st century skills*. Washington, D.C.: Partnership for 21st Century Skills.

37. Rambe, P., & Mlambo, S. (2014). Using digital storytelling to externalise personal knowledge of research processes: the case of a Knowledge Audio repository. *The Internet and Higher Education, 22,* 11–23.

38. Robin, B. (2006). The educational uses of digital storytelling. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference, 2006* (pp. 709–716). Chesapeake, VA: AACE.

39. Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory Into Practice, 47*, 220–228.

40. Sadik, A. (2008). Digital storytelling: A meaningful technology-integrated approach for engaged student learning. *Educational Technology Research and Development, 56*, 487–506.

41. Safran, C., Helic, D., & Gütl, C. (2007). *E-Learning practices and Web 2.0. Proceedings of 10th International Conference on Interactive Computer aided Learning (ICL2007)* (pp.1–8). Villach, Austria.

42. Salpeter, J. (2005). Telling tales with technology. *Technology & Learning 25*(7), 18-24.

43. Sarıca, H.Ç., & Usluel, Y.K. (2016). The effect of digital storytelling on visual memory and writing skills, *Computers and Education, 94,* 298–309.

44. Shih, R. C. (2010). Blended learning using video- based blogs: Public speaking for English as second language students. *Australasian Journal of Educational Technology, 26*(6), 883–897.

45. Smeda, N., Dakich, E., & Sharda, N. (2010). Developing a framework for advancing e-learning through digital storytelling, In M. Baptista & M. McPherson (Eds.). *IADIS International Conference, e-Learning 2010* (pp.169–1). Freiburg, Germany.

46. Tatum, M. (2009). *Digital storytelling as a cultural-historical activity: Effects on information text comprehension* (Unpublished doctoral dissertation). University of Miami.

47. Tendero, A. (2006). Facing versions of the self: The effects of digital storytelling on English education. *Contemporary Issues in Technology and Teacher Education, 6*(2), 174–194.

48. Yang, Y.T.C., & Wu, W.C.I. (2012). Digital Storytelling for enhancing student academic achievement, critical thinking, and learning motivation. A year - long experimental study. *Computers & Education, 59*(2), 339–352.

49. Yuksel, P., Robin, B., & McNeil, S. (2011). Educational uses of digital storytelling all around the world. In M. Koehler & P. Mishra (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2011* (pp. 1264–1271). Chesapeake, VA: AACE.

50. Ware, P. D. (2006). From sharing time to showtime! Valuing diverse venues for storytelling in technology-rich classrooms. *Language Arts, 84* (1), 45–54.