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The Impact of Digital Storytelling on the Academic Achievement and Democratic Attitude of Primary School Students[1]

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Abstract

The aim of this study is to explore the impact of digital storytelling (DST) on the academic achievement and democratic attitude of 4th-grade primary school students and to reveal their experiences in the DST process. The study was conducted with a mixed-method approach. The quantitative part of the study adopted a pretest and posttest quasi-experimental design with 30 students. In the qualitative part of the study, two focus group interviews were carried out with 15 students in the experimental group. The quantitative data was collected through an academic achievement test and a democratic attitude scale. The qualitative data was obtained through two focus group interviews. Descriptive analysis, t-test, and qualitative content analysis were used for evaluating data. Results revealed that the students in the experimental group performed significantly better than the students in the control group in terms of academic achievement and democratic attitude. Focus group interviews highlighted that DST is effective in promoting constructivist learning and lack of experience is the biggest problem in the DST process

Keywords: Digital Storytelling, Democratic Attitude, Academic Achievement, Primary School, Mixed Method Research.

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Introduction

In the 21st century, when technology is highly influential, students are expected to take on the role of "empowered learner" and "knowledge constructor" in the learning process (International Society for Technology in Education [ISTE], 2016; Trilling & Fadel, 2009; Kırıkçı, Ciğerci, & Arıkan, 2020). To develop such student characteristics, student-centered instructional technologies are employed. One of the effective ways to achieve that is digital storytelling (DST) (Chan, 2019; Robin, 2008; Valkanova & Watts, 2007). Several studies reveal that DST is effective in activating these learner characteristics. Because DST allows students to analyze, present, and communicate ideas about any type of content with the support of technology, it enables student engagement, cooperative learning, and creativity, makes students active learners, enhances learning, motivation, and academic achievement, and improves civic engagement (Sadik, 2008; Gyabak & Godina, 2011; Dogan & Robin, 2009; Erbaş, 2020; Ohler, 2006; Hung, Hwang & Huang, 2012; Yigit, 2020). By creating digital stories, students connect with daily life and their learning process is shaped accordingly (Dreon, Kerper & Landis, 2011). DST allows students to learn by themselves and provides permanent learning (Ohler, 2006). Besides, DST is useful in the educational process in uncovering the understandings of students via their thoughts and voices (Yuksel-Arslan, Yildirim & Robin, 2016). With all these benefits, DST has a positive impact on learning as it allows the students to reflect on their experiences in the learning process.

Although DST is a widely used instructional strategy, it remains a challenging issue to effectively apply this strategy to the teaching process. The problems that arise can be caused by the teacher, the student, and the structure of the course. For example, some teachers still have problems in including technology in the teaching process (Yang & Wu, 2012). Moreover, the lack of experience of teachers and students regarding the DST process, limited duration of courses, incorrect technology choice (online or offline tools) in the DST process, boringness of story writing and storyboarding, and difficulty in finding material are some of the problems (Dogan & Robin, 2008; Silseth, 2013; Smeda, Dakich & Sharda, 2014; Kotluk & Kocakaya, 2017; Rahimi & Yadollahi, 2017, Durak, 2018). Also according to the systematic review by Wu and Chen (2020), DST studies about social study topics are limited in the literature. As revealed by various studies, different problematic aspects of DST may emerge. Thus, it has become a necessity to test the effects of DST implementations on different age groups and variables and to evaluate the implementation process.

The review of the literature from this point of view shows that there is limited research on the implementation of DST at the primary school level. At the same time, this limitation at the primary level continues about the impact of DST on democratic attitude and academic achievement, and the evaluation of the DST process. Although there are studies at the primary school level about language teaching (Anderson & Wales, 2012), developing computing skills (Tsai, Shen & Lin, 2015),

promoting twenty-first-century skills and student engagement (Niemi & Multisilta, 2015), revealing students' dreams and life experiences (Duveskog et. al., 2012), investing the DST effects on visual memory capacity and writing skills (Çıralı-Sarıca & Koçak-Usluel, 2016), there is no research examining the effects of DST on achievement and democratic attitudes in Human Rights, Citizenship and Democracy course (HRCD). Therefore, this study aims to explore the impact of digital storytelling (DST) on the academic achievements and democratic attitudes of 4th-grade primary school students and to reveal their views on the DST process. For this purpose, the answers to the following research questions were sought.

RQ1: Is there any significant difference between the students in the experimental and control group in terms of their academic achievement in the HRCD course?

RQ2: Is there any significant difference between the students in the experimental and control group in terms of their democratic attitude in the HRCD course?

RQ3: What are the experimental group students' experiences about the process of learning with DST?

Digital Storytelling

Storytelling is inherent in the roots of civilization. Through storytelling, we can easily make sense of the world (Lambert, 2013), protect our culture (Wang & Zhan, 2010), and lay a bridge between past, present, and future (Harris, 2007). Besides, storytelling is an effective way to uncover experiences (Bruner, 1996). With these benefits, storytelling tradition is important for shaping personal ideas and social structure by providing self-expression; however, the development of technology has changed written storytelling. Thus, traditional storytelling was combined with various types of multimedia, and DST appeared. DST emerged towards the end of the 20th century. Storytelling experiences were enhanced by The Center for Digital Storytelling which combined storytelling tradition with multimedia (Lowenthal & Dunlap, 2010). This center was established by Joe Lambert, Dana Atchley, and Nina Mullen in the late 1980s (Behmer, 2005). They became the first representatives of DST (Storycenter, 2019). Afterward, DST has become a prominent teaching strategy that is not only constructed with various software but also designed in Web 2.0 environments.

There are many definitions of DST. DST is a practice-based instructional strategy in which students create multimedia combined with short stories on their personal real-life experiences (Hartley & McWilliam, 2009). DST is a short narrative that reflects the storyteller's experiences and can be viewed from different technological devices (Davis, 2004). DST is a digitalized version of storytelling for a specific subject (Kobayashi, 2012; Robin, 2016). Thus, traditional storytelling is tried to be made more effective. DST is also a student-centered learning activity that provides reflective thinking

(Nelson, Hull & Roche-Smith, 2008; Valkonava & Watts, 2007; Demirbaş & Şahin (2020). Students are at the center of the DST process. For this reason, they write a script, organize a storyboard, combine the story with multimedia, record their voices, and share them. All of these steps need to be done in a certain order (Kocaman-Karaoglu, 2016). These processes were presented by Lambert (2010) as seven elements of digital storytelling. These are a point of view, dramatic question, emotional content, the gift of your voice, the power of soundtrack, economy, and pace. In other classification, Talan (2021) emphasized these phases in educational processes as pre-production (determining the topic and creating ideas), production (digitalization of scenario and images), post-production (putting the fragments together and arrangements), and distribution (sharing the stories to get comment). By following these steps, teachers or students can create effective digital stories. Although digital stories are developed and brought into the classroom by teachers, they have the greatest impact when they are developed by students individually or in small groups (Robin, 2008). The construction process of digital stories belongs to the students, which enables the learners to structure the information by themselves. Thus, DST can be called a teaching strategy that allows students to learn by reflecting on their experience and knowledge.

Digital Storytelling and Academic Achievement

Previous studies have emphasized that there is a positively strong relationship between DST and academic achievement. This positive effect on academic achievement was observed in different research areas. Social Studies education (Hernández-Ramos & De La Paz, 2009; Kırıkçı, Ciğerci, & Arıkan, 2020), science education (Hung, Hwang & Huang, 2012), foreign language education (Yang & Wu, 2012), and physics education (Kotluk & Kocakaya, 2017) are some of them. Stories provide effective learning by linking daily life and course content (Harris, 2007). Learning motivation increases with experiences reflected in digital stories, thus academic achievement is positively affected (Wu & Yang, 2008). DST activates constructivist learning and higher-level cognitive processes by directing students to research (Robin, 2016, Demirer, 2013). In this way, students shape and present the information they reach according to their own experiences. On the other hand, some studies also show that DST does not have a differentiating effect on academic achievement. For example, in the study conducted by Nam (2017), there was no significant difference in academic achievement due to the structure of the teaching process. A similar result was found in the study conducted by Sarıtepeci (2016). Further studies are necessary to test the impact of DST on academic success because there have been contrasting outcomes revealed by various studies.

Digital Storytelling and Democratic Attitude

Traditional storytelling contributes to individuals by enabling them to evaluate democratic practices and regulate their democratic perspectives (Combs & Beach, 1994). Similarly, the digital form of traditional storytelling, DST is also an effective method for solving antidemocratic problems

such as racism, discrimination, and feeling of exclusion, and strengthening democratic dispositions (Lambert, 2013; López-Bech & Zú i ga, 2017). The use of DST is effective in revealing hidden discriminatory discourses and regulating them (Rolón-Dow, 2011; Malita & Martin, 2010; Matias & Grosland, 2016). DST acts as a mirror by giving individuals the chance to share their positive and negative experiences (Gubrium & Scott, 2010). DST serves as an effective tool in democratic processes by enriching critical thinking, open-mindedness, cultural awareness, and civic engagement (Chan, 2019; Ribeiro, 2016; Truong-White & McLean, 2015). DST strengthens tolerance and respect for differences by giving students from different social and ethnic backgrounds an equal chance for expressing and demonstrating different experiences (Gachago, Condy Ivala & Chigona, 2014; Kim & Li, 2021). In particular, DST is effective in ensuring social inclusion of migrants and refugees (Svoen, Dobson & Bjørge, 2019). Despite all these positive effects, it can not be said that DST strengthens democratic attitudes in every implementation (Balaman, 2015). This assumption makes it necessary to test its impact on democratic attitudes in different grades, cultures, and courses.

Method

Research Model

This study used a mixed research approach that allows combining quantitative and qualitative data. To achieve that, the explanatory sequential design was used. The explanatory sequential design consists of a two-stage process in which the researcher collects quantitative data first, analyzes the findings, and then plans the qualitative stage (Creswell & PlanoClark, 2011). Therefore, in the first part of the research, a quasi-experimental design with a pretest-posttest control group was employed (Fraenkel & Wallen, 2003). The independent variable of the research was DST. Dependent variables were the students' democratic attitudes and academic achievements in the course of Human Rights, Citizenship and Democracy. The teaching process was continued with DST in the experimental group; while in the control group, the traditional teaching process was implemented without any intervention. The qualitative part of the research was carried out through the focus group interviews after the analysis of quantitative data. Focus group interview is a qualitative data collection method that is frequently used in process evaluations (Glesne, 2010). In the qualitative part of this study, the DST experiences of the students were investigated. The students in the experimental group were divided into two groups and were included in the focus group interviews. The research process was presented in Figure 1.

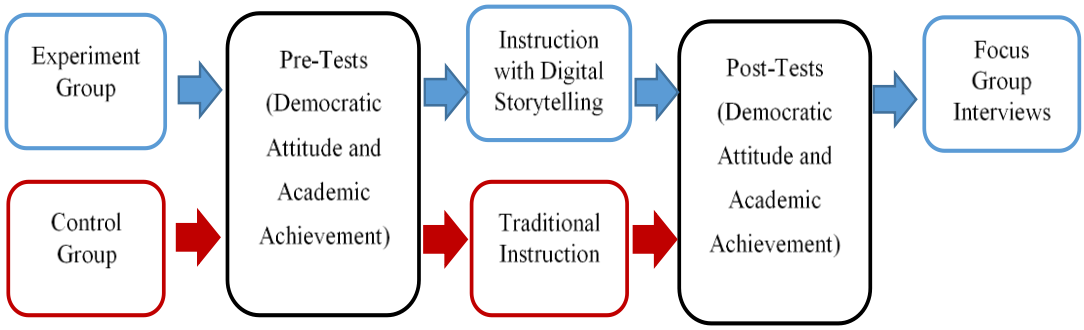

Figure 1. The Research Process

Participants

The participants of the research consist of 4th-grade primary school students in a Central Anatolian province of Turkey in the 2018-2019 spring term. The simple random method was used to determine the research group. A simple random method is a sampling method in which all individuals have an equal chance of being assigned to any group. This sampling method does not include any specific criteria for sample selection (Fraenkel & Wallen, 2003). The experimental and control groups were created through random sampling. Before the implementation process of the research, pre-tests were applied to the determined classes to test the equivalence of the groups and it was understood that there was no difference between them. As shown in Table 1, 30 students, 15 in the experimental group and 15 in the control group, participated in the study. When the participants were examined in terms of gender, it was seen that there was an almost equal distribution of male and female participants.

Table 1. The characteristics of the participants

Gender	Experimental group (%)	Control group (%)	Total (%)
Male	7(46.67%)	9(60%)	16(53.33%)
Female	8(53.33%)	6(40%)	14(46.67%)
Total	15(100%)	15(100%)	30(100%)

Instruments

In the qualitative part of this study, the Academic Achievement Test for Human Rights, Citizenship and Democracy course, and Democratic Attitude Scale (DAS) were used, and in the quantitative part of the study, focus group interviews were utilized.

Academic Achievement Test for Human Rights, Citizenship and Democracy Course which was developed for a doctoral thesis by Aydoğan (2018), was used to measure fourth-grade students' academic achievement. The academic achievement test consisted of 16 questions. The questions were

formed with 4 options in accordance with the age group. The minimum score from the achievement test is 0, and the maximum is 16. The K-20 reliability coefficient of the test was calculated as 0.76.

Democratic Attitude Scale (DAS) was used to measure students' democratic attitudes. The DAS consisted of two sub-factors: reconciliation and empathetic sensitivity, and 25 items were developed by Özer (2004). Some examples of the items in the scale are as follows: "I accept the decisions determined by the group", "I respect the thoughts of others", "I don't want to admit it when I'm wrong". In the scale, a 3-points Likert-scale was used (disagree, neutral, and agree). The Cronbach-Alpha internal consistency coefficient of DAS was calculated between 0.81 and 0.85. Thus, it was assumed that the Democratic Attitude Scale will reliably measure the democratic attitudes of primary school students.

In the qualitative part, the students were divided into groups and 2 focus group interviews were conducted to reveal the views of the experimental group students on the process carried out with DST. A semi-structured interview form was used in the focus group interview. While preparing the interview form, draft questions were created by considering the DST literature, and then expert opinions were taken from two academicians from the field of educational technology. Then, the form consisting of six questions was prepared for implementation. Some of the questions are:

- Could you tell us about the positive aspects of digital storytelling?
- Could you tell us about the difficulties of digital storytelling?
- Would you like to use digital storytelling for your course in the future? Why?

Settings

This study was designed to examine the impacts of DST on the academic achievement and democratic attitude of 4th-grade primary school students and reveal their experiences about DST. The research was conducted in Human Rights, Citizenship and Democracy (HRCD) course which is a compulsory course in primary school 4th grade in Turkey. The course duration is 2 hours per week. The HRCD course aims to enable students to adopt the values regarding democracy, human rights, and citizenship and to embody these values in their daily lives (Ministry of National Education, 2018). Before the research, was contacted with the school and necessary permissions were obtained from the provincial directorate of national education, the school, and the teacher. Afterward, through an interview with the teacher about the DST process, the research process was explained in detail, and the research was started the following week.

In the beginning, four hours of training were given to experimental group students about the DST process and MS Photo Story 3 software. In the research, MS Photostory 3 was used to construct

digital stories instead of more complex tools considering the students' age. In the last part of the training, sample digital stories were created with the students. During the training, digital story creation processes were conducted as stated by Robin (2008). This process consists of identifying the subject, researching it, writing the script, creating an interesting story, combining the story with various multimedia tools (recorded audio, music, video, etc.), and watching it. These steps were followed in the creation and presentation process of digital stories by the experimental group. While creating stories, students were supported on technical issues, and they were provided with an internet connection. After training, pre-test data were collected from both the experimental and control groups.

Then, between the 4th and 11th weeks of the study, digital stories were developed in line with the curriculum. A collaborative design was preferred in the DST. Thus, the students were divided into three groups. Each group consisted of five students who were selected randomly. Each group developed two digital stories with a length of three to five minutes for eight weeks. Digital stories developed by the groups were collected, uploaded to the smartboard, and watched with the whole experimental group students. Finally, at the end of the implementation process, the post-test was applied to the students. As a result of the analysis of the quantitative data, significant differences were found in favor of the experimental group, and focus group interviews were conducted within the scope of the qualitative dimension to investigate the reasons for that. The research process lasted for 13 weeks including training, data collection, and DST implementation. The research process was given in detail in Table 2.

Table 2. Research process

<table>
<tr><th>Weeks</th><th>Topics</th><th>Experimental Group</th><th>Control Group</th></tr>
<tr><td>1th Week</td><td></td><td rowspan="2">Introduction to digital storytelling and training for MS Photo Story 3</td><td>X</td></tr>
<tr><td>2nd Week</td><td></td><td>X</td></tr>
<tr><td>3rd Week</td><td></td><td>Pre-test (Academic Achievement and Democratic Attitude)</td><td>Pre-test (Academic Achievement and Democratic Attitude)</td></tr>
<tr><td>4th Week
5th Week
6th Week
7th Week</td><td>Consensus
(Content: Causes of human conflicts, consensus ways to resolve conflicts, results of conflict and consensus situations)</td><td rowspan="2">Digital Storytelling

(Writing script, Storyboarding, Visual collecting, Combining story with multimedia, editing, sharing, and watching)</td><td rowspan="2">Traditional Methods

(Direct instruction, question-answer method)</td></tr>
<tr><td>8th Week
9th Week
10th Week
11th Week</td><td>Rules
(Content: The relationship between rule, right, and freedom, the contribution of rules to living together, implementation of rules)</td></tr>
<tr><td>12th Week</td><td></td><td>Post-tests (Academic Achievement and Democratic Attitude)</td><td>Post-tests (Academic Achievement and Democratic Attitude)</td></tr>
<tr><td>13th Week</td><td></td><td>Focus group interviews</td><td>X</td></tr>
</table>

Figure 2. An example of digital stories

Figure 3. Editing the story in MS Photo Story 3

Data Collection Process

The data collection process of the research consists of three stages. Firstly, Academic Achievement Test and DAS were applied as pre-tests to experimental and control group students before the DST process. The independent t-test was employed to the pre-test data to find out if there were any statistically significant differences between the groups. Because there was no significant difference between the groups, the implementation process was started. Secondly, at the end of the implementation process, the "Academic Achievement Test" and "DAS" were distributed to students to gather data as a post-test. Thus, all quantitative data within the scope of the research were obtained and analyzed. Lastly, after the post-tests, two focus group interviews were carried out with the experimental group students to reveal their opinions on digital storytelling. Focus group interviews lasted 120 minutes.

Data Analysis

Different data analysis methods were used for quantitative and qualitative data. In the first phase, quantitative data were analyzed with the IBM SPSS Statistics 22.0 program. Before the analysis of quantitative data, the Shapiro Wilk normality test, the coefficient of kurtosis, and skewness were examined. It was found that the kurtosis and skewness values were in the range of +1.5 and -1.5 as recommended by Tabachnick and Fidell (2013). To analyze quantitative data, independent group t-test and paired group t-test were used.

In the second phase, the content analysis which is one of the qualitative analysis methods was used (Lichtman, 2010). Qualitative data were analyzed by the five stages specified by Robson (2015). The qualitative analysis process was carried out in the following order: collecting data, generating initial codes, determining the themes, creating thematic networks, integrating, and interpreting data.

After the coding, Miles and Huberman's (1994) coding reliability of two experts was calculated as 93%. Data were presented with direct quotes.

Results

Academic Achievement

In the first part of the findings, the academic achievement mean scores of the experimental and control groups were analyzed to answer the first research problem. The results of the pre-test of the experiment and control groups are presented in Table 3 below.

Table 3. Comparison of pre-test results of experiment and control groups in terms of academic achievement

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Academic	Experiment	15	10.73	7.00	14.00	1.79	1,494	0.146
Achievement	Control	15	9.87	7.00	12.00	1.36		

According to Table 3, there was no statistically significant difference between the groups in terms of academic achievement (t= 1.494, p>.05). Therefore, students' academic achievement in the "Human Rights, Citizenship and Democracy" course in both groups were similar before the experiment. The independent samples t-test results of the post-test in terms of academic achievement are presented in Table 4.

Table 4. Comparison of post-test results of experiment and control groups in terms of academic achievement

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Academic	Experiment	15	15.00	11.00	16.00	1.37	5.880	.000*
Achievement	Control	15	10.60	5.00	13.00	2.56		

*p <.05.

As seen in Table 4, there was a statistically significant difference between the groups' post-test results in terms of academic achievement (t= 5.880, p<.05). This finding shows that the independent variable makes the experimental group more successful than the control group. Furthermore, paired t-test results are showed in Table 5 below.

Table 5. Comparison between pre-test and post-test results of the experiment group in terms of academic achievement

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Academic	Pre-test	15	10.73	7.00	14.00	1.79	-10.461	.000*
Achievement	Post-test	15	15.00	11.00	16.00	1.37		

*p <.05.

When Table 5 was examined, a significant difference can be seen regarding academic achievement between the pre-test and post-test mean scores of the experimental group (t=-10.461,

p<.05). The paired samples t-test of pre-test and post-test results of the control group in terms of academic achievement are presented in table 6.

Table 6. Comparison between pre-test and post-test results of the control group in terms of academic achievement

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Academic Achievement	Pre-test	15	9.87	7.00	12.00	1.36	-1.749	.102
	Post-test	15	10.60	5.00	13.00	2.56		

According to Table 6, there was no statistically significant difference between the pre-test and post-test of the control group in terms of academic achievement (t= -1.749, p>.05). When the findings are examined, a low increase in the academic achievement of the control group can be observed. This is an indication that the traditional instruction has been ineffective in increasing achievement in the course "Human Rights, Citizenship and Democracy".

Democratic Attitude

In the second part of the findings, the democratic attitude mean scores of the experimental and control groups were analyzed to answer the second research problem. The results of the pre-test of the experiment and control groups are presented in Table 7 below.

Table 7. Comparison of democratic attitude in pre-test results of the experiment and control groups

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Reconciliation	Experiment	15	2.69	1.86	3.00	0.37	0.479	.636
	Control	15	2.63	1.79	3.00	0.35		
Empathetic Sensitivity	Experiment	15	2.70	1.64	3.00	0.42	0.655	.518
	Control	15	2.60	1.73	3.00	0.33		
Democratic Attitude	Experiment	15	2.69	1.76	3.00	0.37	0.598	.554
	Control	15	2.62	1.96	3.00	0.30		

According to Table 7, there was no statistically significant difference between the groups in terms of democratic attitude (t=0.598, p>.05), reconciliation (t=0.479, p>.05) and empathetic sensitivity (t=0.655, p>.05). Therefore, students' democratic attitudes in both groups were similar before the experiment. The independent samples t-test post-test results for democratic attitude are presented in Table 8.

Table 8. Comparison between the experiment and control groups in terms of democratic attitude in post-test

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Reconciliation	Experiment	15	2.85	2.29	3.00	0.22	2.545	.017*
	Control	15	2.59	1.79	3.00	0.33		
Empathetic Sensitivity	Experiment	15	2.85	2.18	3.00	0.25	2.502	.018*
	Control	15	2.61	1.91	3.00	0.28		
Democratic Attitude	Experiment	15	2.85	2.24	3.00	0.22	2.771	.010*
	Control	15	2.61	2.00	2.92	0.28		

*p <.05.

As seen in Table 8, there was a statistically significant difference between the groups' post-test results in terms of democratic attitude (t=2.771, p<.05), empathetic sensitivity (t=2.502, p<.05), and reconciliation (t=2.545, p<.05). These findings show that the process carried out with digital storytelling increases students' democratic attitudes. The paired samples t-test pre-test and post-test results of the experiment group for democratic attitudes are presented in Table 9.

Table 9. Comparison of pre-test and post-test results of the experiment group in terms of democratic attitude

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Reconciliation	Pre-test	15	2.69	1.86	3.00	0.37	-3.317	.005*
	Post-test	15	2.85	2.29	3.00	0.22		
Empathetic	Pre-test	15	2.70	1.64	3.00	0.42	-3.201	.006*
Sensitivity	Post-test	15	2.85	2.18	3.00	0.25		
Democratic	Pre-test	15	2.69	1.76	3.00	0.37	-3.637	.003*
Attitude	Post-test	15	2.85	2.24	3.00	0.22		

*p <.05.

When Table 9 was examined, a significant difference regarding democratic attitude (t=-3.637, p<.05), empathetic sensitivity (t=-3.201, p<.05), and reconciliation (t=-3.317, p<.05) between the pretest and posttest mean scores of the experimental group was observed. The paired samples t-test on the pre-test and post-test results of the control group for democratic attitude are presented in table 10.

Table 10. Comparison of pre-test and post-test results of the control group in terms of democratic attitude

	Groups	N	Mean	Min.	Max.	*SD*	*t*	*p*
Reconciliation	Pre-test	15	2.63	1.79	3.00	0.35	1.169	.262
	Post-test	15	2.59	1.79	3.00	0.33		
Empathetic	Pre-test	15	2.60	1.73	3.00	0.33	-.459	.653
Sensitivity	Post-test	15	2.61	1.91	3.00	0.28		
Democratic	Pre-test	15	2.62	1.96	3.00	0.30	.823	.424
Attitude	Post-test	15	2.61	2.00	2.92	0.28		

According to Table 10, there was no statistically significant difference between the pre-test and post-test of the control group in terms of democratic attitude (t= .823, p>.05), empathetic sensitivity (t= -.459, p>.05) and reconciliation (t= 1.169, p>.05). This finding shows that the teaching process carried out with traditional methods does not increase students' democratic attitudes.

Focus Group Interviews

After the content analysis of focus group interviews, three categories emerged about the implementation of DST. These are "Pros of digital storytelling", "Cons of digital storytelling", and "Formative recommendations".

Pros of Digital Storytelling

The effects of DST lead students to individual learning. This effect frees students from the traditional teaching process and allows them to construct their knowledge enjoyably. The ability of students to blend their old and new knowledge in this process makes the teaching process desirable. Many students in the experiment group agree on that. Thus, constructivist learning has emerged as the most repeated code in this category. The teaching process carried out with DST makes students active learners. Students also seem satisfied with this process. The views of the students are as follows:

S8 - "We did our task freely. In other courses, we listened to our teacher and wrote in the notebook. But in this course, we used the internet, wrote stories and organized them. We did everything".

S11 - "We collected the information. Then we wrote our story. It was very enjoyable to do them on ourselves. I watched our story many times and have not forgotten the information. Because we made it".

S6 – "This lesson was very different. Because our teacher gave us responsibility and wanted us to achieve the desired things. We did everything about our stories and had fun".

Other important advantages emphasized by students are technology support, cooperative learning, increase in motivation, and doing research. The students of the experimental group stated that the DST made the course interesting with the support of technology and provided more motivation. It was also a pleasure to collaborate and do research in the learning process. The positive emphasis of the students on different features of the DST process is an important indicator that DST is adopted by the students. For these reasons, students stated that they wanted to use DST in future courses. The students' views on that are presented below.

S15 – "It was nice to be able to do something. It was also nice that there was no noise in the classroom. So everyone did their duty carefully. Every group studied on their own story. Our teacher told us to focus on the task of our group at the beginning of the course".

S9 - "I liked the course more when we did many things on the computer. We placed the pictures, we edited them in this course".

S3 – "Our teacher divided us into groups. Even my best friends came to my group. So we studied together. We had so much fun. Sometimes we didn't even take a break".

Cons of Digital Storytelling

The students stated that although there were mainly positive things about the DST process, there were also some problems. One of the most important problems mentioned by the students regarding the teaching process carried out with DST is the story writing stage. The students indicated that because they did not write a story in previous courses, they had difficulty in constructing the story and determining the characters and places of the story. The main reason for this negative aspect is thought to be the lack of experience in imagining and using creativity in the process of story writing.

Besides, under this category, it is important that the students do not express any problems regarding technology use or technical support. Some of the student views are as follows;

S13 - "We just had a little bit of trouble in the story-writing process. Especially we had trouble identifying people and places. Because we had to design detailed things here. Apart from that, the course was nice".

S3 -"I had difficulty in writing the story with my group friends in the first courses because we thought and decided together. Since we have never done this before, it is hard to decide. Initially, it was hard. Then I got used to it".

The other important problem is about doing research. The students of the experimental group stated that they had difficulty in the process of collecting information and visuals. This problem also gives important clues about how the previous lessons were handled. It is thought that the teacher's maintaining the traditional lesson structure in previous lessons plays an important role in the students' inadequate research skills. According to them, these details slowed down the story formation process.

S14 - "Gathering information was difficult in the first weeks of the course. Our teacher said nothing this time. She said that you will find it. …We tried really hard to gather information. We even thought a lot about which information to use with my friends".

S1 - "I had trouble trying to find a picture. Because we wanted to find proper pictures of our story. But it took quite some time to find the one that fits our story. We searched a lot online. We were finally able to decide".

Formative Recommendations

The last category of the qualitative part was formed within the scope of the students' suggestions regarding the process carried out with DST. In this category, the main emphasis is on the experience. Increasing the experience of writing stories and gathering information comes to the forefront as students make most of the suggestions through further stages. Students think that the process will be more effective as the experience of the stages of DST increases. Besides, the data

obtained for this category show consistency with the other categories. Examples of students' views are presented below.

S6 - "I think more stories should be written. When we got used to writing, we wrote different things and it was easier".

S10 - "I'd like to get information easier. You might find it hard to investigate. It would be easier if we were used to it. If we could find information easier, we wouldn't have any trouble".

S9 – "I think, we should write more stories before teaching. I was a little surprised because we did not write often before. Then I got used to it".

Discussion

Although integration of technology into teaching processes appears to be important, it is not easy to achieve it effectively. Many factors such as time, experience, cost, usability, etc. affect the integration of technology into the teaching processes. However, DST is regarded in the literature as one of the teaching strategies that reduce the effect of these obstacles (Behmer, 2005, Kobayashi, 2012, Gyabak & Godina, 2011). Thus, it provides ease of use to the practitioners. As a result, studies have been investigating the effectiveness of DST in different areas. However, it has been concluded that research on academic achievement, democratic attitude, and process evaluation at the primary school level is limited. Therefore, this study aims to explore the impact of DST on academic achievement and democratic attitude and to reveal students' experiences on the DST.

According to the results of this study, DST has a significant impact on academic achievement and the democratic attitude of 4th-grade students. Besides, DST provides constructivist learning; therefore, students develop positive perceptions towards the learning process (Demirbaş & Şahin, 2020). In terms of academic achievement, results are consistent with the qualitative dimension of the research. Thanks to constructivist learning, students constructed their knowledge, thereby, academic achievement in the HRCD course was increased significantly compared to the control group. This result was supported by previous studies (Sadik, 2008; Hung, Hwang & Huang, 2012; Yang & Wu, 2012). For instance, Demirer (2013) found that DST increased academic achievement in Social Studies courses and indicated that one of the most important reasons for this was the reflection of the constructivist understanding of the teaching process. Similarly, in the study by Hernández-Ramos and De La Paz (2009), the same positive effect emerged in the Social Studies course. Likewise, in the meta-analysis study conducted by Talan (2021), it was concluded that digital storytelling is more effective in increasing academic achievement compared to the traditional approach. In contrast to all these studies, it was also found that DST did not increase academic achievement (Nam, 2017). To illustrate, the research done by Sarıtepeci (2016) in the Social Studies course revealed that DST did

not make a difference in the students' post-test academic achievement. The lack of experience mentioned in the qualitative results of our study may be a cause of these contradictory results. These studies, which have contradictory results, necessitate new studies to investigate the impact of DST on academic achievement.

When examining the results in the sense of democratic attitude, we see that a positive effect has occurred. Students' formation of meaning together with DST affects democratic attitudes and strengthens democratic dispositions. Earlier studies support these claims (López-Bech & Zú i ga, 2017; Truong-White & McLean, 2015; Gachago, Condy, Ivala, & Chigona, 2014; Rolón-Dow, 2011; Gubrium & Scott, 2010; Matias & Grosland, 2016; Ribeiro, 2016; Kim & Li, 2021; Svoen, Dobson & Bjørge, 2019), too. For instance, Chan (2019) investigated the impact of DST on critical and reflective thinking mindsets. The researcher reported that DST reduces youths' ethnocentric views. Likewise, Malita and Martin (2010) stated that both the digital storytelling process and product strengthened democratic tendencies. Thus, it can be concluded that the students' views on life and democratic disposition may change through DST. As stated in the qualitative results, by directing students to the research and enabling them to create their own stories, DST strengthens democratic tendencies. However, the findings of the current study do not support the previous research done by Balaman (2015), which indicated that DST does not affect students' democratic value judgments. This result is an indication that the relationship between DST and democratic tendencies should be examined by further studies.

The qualitative results of the study were also consistent with the quantitative part. As a positive effect of DST, the experimental group stated that the information was learned by them. Thus, it was determined that constructivist learning was achieved with the aid of technology and it had a significant effect on the dependent variable. In the results of their study, Lowenthal and Dunlap (2010) stated that with DST, the students reflect their thoughts and perspectives. In parallel with this research, Kocaman-Karaoglu (2016) also found that the learning process became more enjoyable due to the practical structure of DST. Simirlarly, Kırıkçı, Ciğerci, and Arıkan (2020) also concluded that students' interest in Social Studies course and learning motivation increased due to DST. In another study, Yuksel-Arslan, Yildirim and Robin (2016) reported that DST is effective in the formation of knowledge, especially in transforming abstract knowledge to concrete knowledge. In addition to these positive aspects, the DST process has some drawbacks as expressed in the qualitative part. In this context, the lack of DST experience and the difficulty of conducting research has come to the fore (Silseth, 2013). In the study conducted by Yigit (2020), the lack of experience was defined as one of the negative aspects of the DST process. Similar problems were also mentioned in the study conducted by Dreon, Kerper and Landis (2011). They indicated that problems concerning students' learning needs might arise. Likewise, Durak (2018) conducted a study on programming with middle

school students and found that one of the difficulties was finding materials to use in the story. In the study, conducted by Wang and Zhan (2010), technical problems in the formation of digital stories occurred. However, the researchers stated that this problem disappeared as the DST experience increased.

Conclusions and Recommendations

DST is a technology-supported effective instructional strategy. DST enriches teaching processes because it requires low-cost material and includes a student-centered and constructivist learning process. Thus, unlike traditional teaching, it enables students to construct knowledge by themselves. This assumption was supported in this research as well. This study set out to investigate the impact of digital storytelling on academic achievement and democratic attitude and reveal 4th-grade students' views about DST. Three main conclusions were reached after the research. Firstly, this study has shown that compared to the traditional teaching process, digital storytelling has a better effect on students' academic achievement in the HRCD course. Secondly, it is more effective than traditional teaching in increasing the democratic attitude of 4th-grade students. Finally, despite some difficulties, students enjoy the process of teaching with DST, construct their knowledge, and want to use it again in the future. Overall, this study strengthens the idea that DST is an effective technology-supported teaching method adopted by students.

Although the study has gone some way towards enhancing our understanding of teaching with DST and its impacts on academic achievement and democratic attitude, it has certain limitations. The major limitations of this study are the small sample group and including participants only from a single middle school. To eliminate these limitations, further studies should be conducted in multiple schools and with larger numbers of samples. Besides, the qualitative part of the research provides limited data. Qualitative data may be expanded with case studies that investigate students' experiences in teaching with DST. The implementation process covers eight weeks except for training and data collection. Therefore, academic achievement and democratic attitude change in the HRCD course should be tested with longitudinal studies. This research was based on the comparison of DST and traditional teaching. This makes it necessary to compare the effectiveness of DST with different teaching methods such as problem-based learning, cooperative learning, etc. In this research, students were divided into groups and DST was maintained in this way. This necessitates research in which DST is carried out individually. Finally, other researchers may design research with different data collection tools to investigate the effects of DST on academic achievement and democratic attitude in the HRCD course.

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