THE EFFECTS OF DIGITAL PORTFOLIO ASSESSMENT PROCESS ON STUDENTS' WRITING AND DRAWING PERFORMANCES

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ABSTRACT
In this paper, it was investigated the effect of digital portfolio assessment process on the drawing and story writing performances of the 14-15 ages students. For this reason, a digital portfolio assessment rubric was prepared in order to evaluate students' drawing and story writing works. For the validity and reliability analyze was applied to 52 high school students. According to analyzes, the digital portfolio assessment rubric, which is valid and reliable, can be used in order to evaluate students' drawing and writing performance. For the application of program, an experimental and a control group were used in the study. The study was conducted during 4 months. The data was gathered 52 students, 17 in the experimental groups and 35 in the control groups. Digital portfolio assessment process was used in the experimental group and traditional assessment plan was used in the control group. In both groups students were wanted to engage drawing and writing. Results indicate that no significant differences ($p>.05$) were found on drawing and writing performances pre-test scores of the groups but a significant difference ($p<.05$) were found in favor of experimental group in post-test scores of both groups.

KEY WORDS: Performance assessment, digital portfolio, assessment rubric.

INTRODUCTION

Performance assessment techniques are often recommended as alternatives to traditional fixed-response rating scales and to standardized tests of achievement. Performance assessment has been defined to consist of such measures of understanding and skill of higher-order, complex tasks as "direct writing assessments, open-ended written questions, hands-on experiments, performances or exhibits, and portfolios" (Aschbacher, 1991).

Portfolio assessment is used in many fields such as fine arts, marketing, architecture and education. Portfolio is defined as "a purposeful collection of student works that display the efforts, development and successes of the learner" (Paulson, Paulson & Meyer, 1991: 60; Jacobson, Sleicher & Maureen, 1999; Mullin, 1998). The most distinctive property of portfolio is that it makes a person both assessor and assessed, apart from making him/her assessed. In this case, apart from being the object of assessment, the student is both the partner of the assessed object and the assessment (Wolf, 1991: 130). Here, the learner actively participates in the selection of the content and determining the selection criteria. Portfolios serve both for the teacher and for the student. It provides students the opportunity to project their successes and teachers the opportunity to evaluate the development and success of the students. Students test their own works and project them on their targets for the future. Traditional tests do not reveal the development and all skills of the individual (Barton & Collins, 1993).

One of the many benefits of portfolio is that brings clarity to the fairness problems in assessing the student performances. Assessment will no longer be a secret method, the quality of their works will be judged by themselves and they will develop standards. In determining the assessment criteria negotiation between the learners and between learner-teachers has an important role. In order to shape the assessment criteria, class discussions of students are allowed. This method provides an educational environment both for the students and for the teachers (Mullin, 1998). This environment will enable the student to be responsible for his/her own development and learning and be aware of his/her own improvement. So, an opportunity will be provided for the learners to assess their own learning. For this reason, it is important to develop an assessment rubric that is reliable and applicable as independently as possible.

Students and teacher reach a common decision by acting together to determine the structure, contents and criteria of the portfolio and the necessary documents. While defining the liabilities of teaching, Beevevino, Dengel & Adams (1999: 276) state them as "choosing activities, making the students participate in the activities, arranging problematic situations, acting as a catalyst and providing the divergent solutions of the students". Instead of arranging the learning of students autocratically, the teacher should support the students for their personal tendencies. This new task of the teacher focuses on encouraging instead of judging students and showing alternatives instead of imposing ideas. This situation provides flexibility for the learning environment.

Digital portfolio is the transformation of all the products reflecting the development of an individual into soft copies that can be read in digital format (Chang, 2001). The conveniences that technology has brought in every field have given way to the idea that the portfolios could be prepared in digital environment. Digital portfolio is similar to the traditional portfolio; however digital portfolios require especially technology knowledge and skills. In addition, digital portfolios require the use of a composition of electronic media resources such as hypermedia programs, database, word processor software and web design programs. Digital portfolios are collected in a hard disc, a CD-Room or Home Page, corrections can be made on them when necessary and it is easy to carry them.

Woodward & Nanlohy (2004) made a research that aims to report on the process of the development of digital portfolios as an alternative method of reporting and presenting student learning, as opposed to the current paper-based portfolios used in pre-service teacher education. A study of the processes employed by nine students who elected to develop their portfolios digitally was carried out over a three-semester period. This resulted in a procedure that assisted students in using Information Communication Technology to showcase their learning. The advantages and limitations of the use of such technology and the results of this process during its initial implementation were discussed.

Druin, Revelle, Bederson, Hourcade, Farber, Lee & Campbell (2003) made a research on 98 second and third grade children (ages 7–9 year-old). The results of the study show distinct differences between conditions in how children discussed their shared goals, collaborative tasks, and what outcomes they had in successfully finding multimedia information in the digital library.

Tezci & Dikici (2004) investigated whether there is an effect of portfolio assessment approach on the verbal and figural creativity of the high school students. In the study, Torrance's Creativity Thinking Test Verbal and Figural Form were used to measure verbal and figural creativity of the students. In the results, a significant difference was found in favor of experimental group both verbal and figural creativity in post-test scores of both groups.

Education should support the development of creative thinking and teaching-learning activities, methods and techniques, teaching materials and assessment situations both in teacher-student relationship and in education environment. Teacher-student relationship, assessment approaches affect the development of creative thinking processes considerably (Torrance, 1995; Olson, 1999). Education should focus on teaching students high-level objectives in the cognitive and psychomotor fields. Creative thinking will grow in situations where there is psychological reliability for the individual. Objective tests measure the behaviors of students, especially in knowledge and comprehension of Bloom's Taxonomy levels; it can be applied in the application level scarcely. The questions asked in objective measurement and assessment approaches are closed-ended and measure the development of convergent thinking, therefore may hinder the development of creative thinking.

The education process that will enable to develop creative thinking should be less restrictive, emphasizing the learning of the student, including high level thinking processes in measurement and assessment, based on real life situations instead of being artificial, non-threatening and it requires enabling psychologically independence and reliability. As a matter of fact, the studies that have been carried out to develop creative thinking include divergent thinking processes. These can be listed as follows: writing stories, drawing a picture, writing poems, creative education programs, rhythmic works, scientific activities (Everatt, Steffert, & Smythe, 1999; Wolfradt, & Pretz, 2000; Niu & Sternberg, 2003). Because of the list, it is necessary to research drawing and writing performance of students.

The main aim this research was to investigate the effects of digital portfolio assessment process on the drawing and story writing performances of the students. In other words, it is to determine whether there is a difference between the drawing and writing performances of the experimental group students to whom portfolio assessment was applied and the control group students to whom traditional assessment approach was applied.

METHOD

Participation

In this study, pre-test and post-test model of Champbell & Julion (1966) were formed to an experimental group and a control group by using. The population of the research is composed of adolescents varying between ages of fourteen and fifteen. As the research has a digital property and work will also be done with the students in the Internet environment, seventeen students as experiment group and thirty-five students as the control group students were selected by random sampling.

Data Gathering Method
An assessment rubric has been developed for the assessment of the digital portfolio materials that the students prepared as a data-collecting tool. The basic components of the student performances required for drawing performance are: "character, action, creativity and esthetics". The basic components of writing performance are: "Subject, character, stage setting and conflict". Point assignment was made that enables measurable assessment for each component of assessment rubric. Points were assigned as increasing one by one from "zero" to "four and five". This kind of point assignment provides flexibility for the scorers in scoring (Herman, Gearhart & Baker, 1994; Custer, 1996; Moscal, 2000).

Eight evaluators including the researchers evaluated the drawings and writings of the students painted and written. The researcher and two art teachers participated in the assessment. The assessors made assessments individually and without an outside effect. The scorers weren't informed which group is the control group and which one is the experimental group during application of the program. Shaka & Bitner (1996) and Moscal (2000) state that there should be a harmony between the scorers for the reliability of the evaluation rubrics. The concept of scorer reliability was used for this. Wragg (2001: 23-24) mentions that there is a way to ensure the reliability of the harmony in the points that the scorers give without being aware of each other. The scorer reliability is the possibility that different scorers assign similar points. Koretz, Stecher, Klein, McCafery & Deibert (1993: 49) mention that increasing the harmony between the scorers is enabled by increasing the material to be scored and the scorers. In the event that there is a disharmony between the scorers, teaching the scorers is important.

In the initial application, the drawings of 52 students were studied. The results of the reliability analysis made for the points given by the scorers in the initial application are as follows:

Correlation among the Scorers for Sub-Components of Drawing Performance Rubric
While the lowest correlation among the four scorers is .79 between the C and D scorer, the highest correlation is .85 between A and C scorers in scoring the character. Cronbach Alpha value has been found .94.

While the lowest correlation among the four scorers is .63 between A and B scorers, the highest correlation has been .86 between A and C scorer in scoring action. Cronbach Alpha value is .93.

While the lowest correlation among the three scorers is .48 between B and C in scoring creativity, the highest correlation has been found .65 between B and D scorer. Cronbach Alpha value is .83.

While the lowest correlation among the three scorers is .74 between C and D scorers in scoring the basic components about esthetics, the highest correlation has been found .91 between A and D scorers. Cronbach Alpha value is .94.

However, Wragg (2001) states that the scorers may incline to "central clustering". Therefore, after the scoring of the assessors, the works of 10 students of which the highest (three works), medium (four works) and the lowest (three works) scored works of the experiment and control groups were subjected to scoring by a researcher and assessor again, and the similar point assignments were analyzed. The works of those who did not perform the task were not included in the scoring. The interscorer reliability should be 65% in situations where no error is required, that is 0% decomposition, and 85% in situations where there is a ±1 difference between points (Greene, 2001; Wragg, 2001; Koretz et. al., 1993). The scoring reliability of the two scorers as a result of the reliability analysis of the scoring rubric developed in this context is as follows: Character: 70%, action: 70%, creativity: 70%, esthetics: 70%, creativity: 70%.

Correlation among the Scorers for Sub-Components of Writing Performance Rubric
While the lowest correlation among the four scorers is .59 between the A and B scorer, the highest correlation is .86 between B and C scorers in scoring the subject. Cronbach Alpha value has been found .91.

While the lowest correlation among the four scorers is .46 between the A and D scorer, the highest correlation is .81 between B and C scorers in scoring the character. Cronbach Alpha value has been found .90.

While the lowest correlation among the four scorers is .59 between the A and B scorer, the highest correlation is .79 between C and D scorers in scoring the stage setting. Cronbach Alpha value has been found .90.

While the lowest correlation among the four scorers is .58 between the A and D scorer, the highest correlation is .78 between B and C scorers in scoring the intrigue. Cronbach Alpha value has been found .89.

After the scoring of the assessors, the works of 10 students of which the highest (three works), medium (four works) and the lowest (three works) scored works of the experiment and control groups were subjected to scoring by a researcher and assessor again, and the similar point assignments were analyzed. The scoring reliability of the two scorers as a result of the reliability analysis of the scoring rubric developed in this context is as follows: Subject: 80%, Character: 70%, Stage setting: 70%, Conflict: 80%.

Correlation between Students' School Marks and Rubrics Points

Koretz et. al. (1993) states that determining whether the rubric can be generalized or not in the validity studies of the rubric is important. For this, the successes of the students should be consistent in alternative measurements. Another analysis made within this framework searches the correlation between the art lesson success mean and the mean that is acquired with the drawing performance rubric. At the end of the analysis, Pearson correlation coefficient has been found meaningful at .70 and .01 level. Correlation between the Turkish-literature lesson success and writing performance has been found meaningful at .84 and .01 level.

Correlation among Sub-Components of Drawing and Writing Performance

Koretz et. al. (1993) states that the students will basically display the same performance of the certain performance tasks with the sub-components of the performance. In other words, a student should have similar levels of performance in the sub-components of drawing and writing performance. While the lowest correlation is .50 between character and creativity in the scoring of drawing performance, the highest correlation is .77 between creativity and esthetics. While the lowest correlation is .88 between subject and character in the scoring of writing performance, the highest correlation is .95 between stage setting and conflict.

Application of Program

In the process of the research teaching was carried out in a traditional manner by researchers in the control group. As for he experimental group, teaching was carried out depending on the digital portfolio evaluation. The process was completed as following:

Identification of the Aims: First of all students were required to identify aims for their portfolios they would prepare. The study of the identification of the aims was carried out at the first week. The significance of the aims, the frame, that would be provided for the portfolios the students would improve, its significance and necessity were explained to the students.

Identification of the features necessary for a qualified study and the presentation of assessment rubric in this frame: What would be the features necessary for a qualified study (drawing, writing stories) were determined by discussing in face-to-face meeting with students. The instruction of the evaluation that had been improved beforehand was presented in this frame. What features were sought for the studies that would carried out by students and the duties that would presented, the instruction of the evaluation indicating the criteria for evaluation and scoring system were explained to each student.

Duties (Responsibilities): Each student was required to draw at least a picture based on a story and make up a story based on a picture for his/her portfolio that s/he would hand in at the end of the practice. It was stated that the students could add the studies determined by themselves apart from these duties. The time for drawing a picture based on given story and making up a story based on given picture was determined as 10 weeks. Furthermore, the time for making up a story depending on a picture determined by students themselves and drawing a picture depending on the story written by students themselves was determined as 6 weeks.

Prerequisite-tests aimed studies were taken from experimental and control groups before starting the program. The program lasted for 4 months. With 2 hours in class and 4 hours computer based, a total number of 6 hour-practiced in a week were done. During the application of the program, it was made use of the packet programs such as Word Processor, Paint Brush and Illustrator. The works of the students in computer environment were stored on electronic mail addresses and CD-Rooms in the process of the application of the program. Students asked questions via electronic mail out of the classroom, presented their works, shared ideas, asked the opinions of their friends about their works and explain their own idea and opinions. At the end of the program, students handed in the completed portfolios. Those portfolios were evaluated as final-test. In each stage of the written stories and drawn pictures (at the end of each course) the quality of the students' works were evaluated. Besides, necessary correction and feedback were provided so that there was scope for students to realize incorrect and inefficient parts of their works and to revise them.

Sample works and rubric: Sample works and the instruction of the evaluation were sent to the electronic mail addresses of the students. Thus, the students had opportunity to know not only which samples of the work were good, average and unsuitable but also for what reasons those works were evaluated in that way. They got chance to improve their works in that frame.

The storage of the works and the style of the presentation: The explanation for the storage of the students' works and how they would present prepared portfolios were given in the first session. There were some alternatives for students to store their works on computers, cd-rooms or disks. The opportunity of making use of scanner was given to students in order to transfer the works done by pen and paper to digital environment. Students presented the drafts of each of work their own in a chronological order.

Analysis of Data

Data acquired at the end of the research were processed in SPSS for Windows package program. Arithmetical mean, standard deviation and *t*-test were used as analysis techniques. In the comparison of groups, independent samples *t*-test was used and the homogeneity of the variations was tested with Levene's Test. In the pre-test and post-test comparisons, paired samples *t*-test was used and the homogeneity of the variations was tested with Kolmogorov-Smirnov Z test. In the situations where the variances are homogeneous, ($p>.05$) parametrical tests (*t*-test) were used. Reliability level is .05

FINDINGS and COMMENTS

In this section, the findings acquired as a result of the research have been analyzed according to the related hypotheses.

Hypothesis 1: There is not a meaningful difference between pre-test and post-test the drawing based on story points of the experimental group to whom digital portfolio assessment was applied.

Table 1. Table of Analysis Related To the Pre-Test and Post-Test Scores of the Experimental Group in Which Digital Portfolio Assessment Was Used

Sub-Components	Exp. Group	n	$\bar{x}$	Std. Dev.	Kolmogorov z	Kolmogorov Sig.	r	df	t	p
Character	Pre-test	17	2.31	1.25	.686	.734	-.14	16	-5.34*	.000
	Post-test	17	5.07	1.54	1.040	.230				
Action	Pre-test	17	1.94	1.20	.560	.913	-.08	16	-5.31*	.000
	Post-test	17	4.70	1.67	.892	.404				
Creativity	Pre-test	17	2.07	1.06	.604	.858	-.01	16	-5.30*	.000
	Post-test	17	4.72	1.74	.549	.924				
Esthetics	Pre-test	17	2.09	.98	.929	.353	-.08	16	-4.83*	.000
	Post-test	17	4.54	1.76	.621	.836				

*p<.05 Significance

According to the *t*-test result made between pre-test and post-test points of the experimental group to whom digital portfolio assessment method was applied, it was seen that a meaningful difference existed $[t(16) = -5.34 p < .05]$ in the character aspect, $[t(16) = -5.31 p < .05]$ in action aspect, $[t(16) = -5.30 p < .05]$ in creativity aspect, $[t(16) = -4.83 p < .05]$ in esthetics aspect and hypothesis 1 was rejected. This situation can be interpreted that the applied digital portfolio assessment method improves the drawing performances of the students (See Table 1).

Hypothesis 2: There is not a meaningful difference between the pre-test and post-test drawing based on story points of the control group to whom traditional method was applied.

Table 2. Table of Analysis Related To the Pre-Test and Post-Test Scores of the Control Group in Which Traditional Method Was Used

Sub-Components	Control Group	n	$\bar{x}$	Std. Dev.	Kolmogorov z	Kolmogorov Sig.	r	df	t	p
Character	Pre-test	35	2.36	1.02	1.231	.097	.28	34	-1.83	.075
	Post-test	35	2.76	1.15	1.062	.209				
Action	Pre-test	35	2.15	1.07	1.093	.183	.11	34	-1.83	.076
	Post-test	35	2.57	1.00	.738	.648				

Creativity	Pre-test	35	2.26	1.08	1.142	.148	.25	34	-2.44*	.020
	Post-test	35	2.73	.68	.990	.281				
Esthetics	Pre-test	35	2.11	.99	1.246	.090	.64	34	-2.09*	.044
	Post-test	35	2.38	.77	.690	.728				

*p<.05 Significance

According to the result of the *t*-test made between the pre-test and post-test points of the control group to whom traditional teaching method was applied, there was a meaningful difference of $[t(34) = -1.83 p > .05]$ in character aspect, $[t(34) = -1.83 p > .05]$ in action aspect, $[t(34) = -2.44 p < .05]$ in creativity aspect, $[t(34) = -2.09 p < .05]$ in esthetics aspect and hypothesis 2 was rejected. It can be said that the drawing performances of the control group students has improved (See Table 2). In this case, it will be better to make a comparison between the experimental group and the control group.

Hypothesis 3: There is not a meaningful difference between the drawing based on story pre-test points of the experimental group to whom digital portfolio assessment method was applied and the control group to whom traditional method was applied.

Table 3. Results of the Analysis Related To the Pre-Test Scores Between The Experimental Group and Control Group

Sub-Components	Groups	n	$\overline{x}$	Std. Dev.	Leven's Test F	Leven's Test Sig.	df	t	p
Character	Exp.	17	2.31	1.25	.538	.467	50	-.14	.885
	Control	35	2.36	1.02					
Action	Exp.	17	1.94	1.20	.305	.583	50	-.64	.525
	Control	35	2.15	1.07					
Creativity	Exp.	17	2.07	1.06	1.180	.282	50	-.59	.557
	Control	35	2.26	1.08					
Esthetics	Exp.	17	2.09	.98	.175	.678	50	-.50	.956
	Control	35	2.11	.99					

According to the result of the t test made between the experimental and control group before the application of digital portfolio assessment method, there is not a meaningful difference $[t(50) = -.14 p > .05]$ in character aspect, $[t(50) = -.64 p > .05]$ in action aspect, $[t(50) = -.59 p > .05]$ in creativity aspect, $[t(50) = -.50 p > .05]$ in esthetics aspect (See Table 3). In this case, hypothesis 3 was accepted for the character, action and creativity and esthetics aspects. The pre-test results show that similarity the students' drawing performance. It will be beneficial to examine the analysis between the experimental group and the control group after the application of digital portfolio assessment method.

Hypothesis 4: There is not a meaningful difference between the drawing based on story post-test points of the experimental group to whom digital portfolio assessment method was applied and the control group to whom traditional method was applied.

Table 4. Result of the Analysis Related To the Post-Test Scores Between The Experimental Group and Control Group

Sub-Components	Groups	n	$\overline{x}$	Std. Dev.	Leven's Test F	Leven's Test Sig.	df	t	p
Character	Exp.	17	5.07	1.54	1.611	.210	50	6.02*	.000
	Control	35	2.76	1.15					
Action	Exp.	17	4.70	1.84	.680	.112	50	5.71*	.000
	Control	35	2.57	1.67					
Creativity	Exp.	17	4.72	1.00	.710	.211	50	5.92*	.000
	Control	35	2.73	1.74					
Esthetics	Exp.	17	4.54	1.76	.743	.264	50	6.15*	.000
	Control	35	2.38	.77					

*p<.05 Significance

According to the result of the *t*-test made between the post-test points of the experimental group and the control group, it is seen that there is a meaningful difference $[t(50) = 6.02 p < .05]$ in character aspect, $[t(50) = -5.71 p < .05]$ in action aspect, $[t(50) = 5.92 p < .05]$ in creativity aspect, $[t(50) = 6.15 p < .05]$ in esthetics aspect (See Table 4). In this case, hypothesis 4 has been rejected. There has been more increase in the arithmetical mean of the experimental group than that of the control group. The acquired data reveal that digital portfolio assessment method improves the drawing based on story performances of the students more than the traditional assessment method.

Hypothesis 5: There is not a meaningful difference between pre-test and post-test the writing based on picture points of the experimental group to whom digital portfolio assessment was applied.

Table 5. Table of Analysis Related To the Pre-Test and Post-Test Scores of the Experimental Group in Which Digital Portfolio Assessment Was Used

Sub-Components	Exp. Groups	n	$\bar{X}$	Std. Dev.	Kolmogorov z	Kolmogorov Sig.	r	df	t	p
Subject	Pre-test	17	1.95	.85	1.006	.263	.51	16	-6.05*	.000
	Post-test	17	3.16	.80	.692	.724				
Character	Pre-test	17	2.23	1.07	1.205	.109	.50	16	4.17*	.001
	Post-test	17	3.22	.82	.556	.916				
Stage setting	Pre-test	17	2.04	1.06	.776	.584	.51	16	-4.48*	.000
	Post-test	17	3.16	1.18	.702	.707				
Conflict	Pre-test	17	2.10	1.04	1.011	.258	.40	16	-4.31*	.001
	Post-test	17	3.22	.90	.550	.923				

*p<.05 Significance

According to the *t*-test result made between pre-test and post-test points of the experimental group to whom digital portfolio assessment method was applied, it was seen that a meaningful difference existed $[t(16) = -6.05 p < .05]$ in the subject aspect, $[t(16) = 4.17 p < .05]$ in character aspect, $[t(16) = -4.48 p < .05]$ in stage setting aspect, $[t(16) = -4.31 p < .05]$ in conflict aspect and hypothesis 5 was rejected. This situation can be interpreted that the applied digital portfolio assessment method improves the writing performances of the students (See Table 5).

Hypothesis 6: There is not a meaningful difference between the pre-test and post-test writing based on picture points of the control group to whom traditional method was applied.

Table 6. Table of Analysis Related To the Pre-Test and Post-Test Scores of the Control Group in Which Traditional Method Was Used

Sub-Components	Control Group	n	$\bar{X}$	Std. Dev.	Kolmogorov z	Kolmogorov Sig.	r	df	t	p
Subject	Pre-test	35	1.89	.82	1.299	.069	.20	34	-3.85*	.000
	Post-test	35	2.62	.94	1.063	.209				
Character	Pre-test	35	2.17	1.00	1.291	.071	.16	34	2.39*	.022
	Post-test	35	2.66	.87	.863	.445				
Stage setting	Pre-test	35	1.99	1.09	1.083	.191	.11	34	-2.83*	.008
	Post-test	35	2.60	.80	.849	.467				
Conflict	Pre-test	35	2.08	.93	1.154	.901	.12	34	-2.61*	.013
	Post-test	35	2.62	.92	.098	.392				

*p<.05 Significance

According to the result of the *t*-test made between the pre-test and post-test points of the control group to whom traditional teaching method was applied, there was a meaningful difference of $[t(34) = -3.85 p < .05]$ in subject aspect, $[t(34) = 2.39 p < .05]$ in character aspect, $[t(34) = -2.83 p < .05]$ in stage setting aspect, $[t(34) = -2.61 p < .05]$ in conflict aspect and hypothesis 6 was rejected. It can be said that the writing based on picture performances of the control group students has improved (See Table 6). In this case, it will be better to make a comparison between the experimental group and the control group.

Hypothesis 7: There is not a meaningful difference between the writing based on picture pre-test points of the experimental group to whom digital portfolio assessment method was applied and the control group to whom traditional method was applied.

Table 7. Results of the Analysis Related To the Pre-Test Scores Between The Experimental Group and Control Group

Sub-Components	Groups	n	$\overline{X}$	Std. Dev.	Leven's Test F	Leven's Test Sig.	df	t	p
Subject	Exp.	17	1.95	.85	.001	.997	50	.256	.799
	Control	35	1.89	.82					
Character	Exp.	17	2.23	1.07	.162	.689	50	.210	.835
	Control	35	2.17	1.00					
Stage setting	Exp.	17	2.04	1.18	.303	.584	50	.154	.878
	Control	35	1.99	1.09					
Conflict	Exp.	17	2.10	1.04	.262	.611	50	.060	.952
	Control	35	2.08	.93					

According to the result of the t test made between the experimental and control group before the application of digital portfolio assessment method, there is not a meaningful difference $[t(50) = .256 p > .05]$ in subject aspect, $[t(50) = .210 p > .05]$ in character aspect, $[t(50) = .154 p > .05]$ in stage setting aspect, $[t(50) = .060 p > .05]$ in conflict aspect (See Table 7). In this case, hypothesis 7 was accepted for the subject, character, stage setting and intrigue aspects. The pre-test results show that similarity the students' drawing performance. It will be beneficial to examine the analysis between the experimental group and the control group after the application of digital portfolio assessment method.

Hypothesis 8: There is not a meaningful difference between the writing based on picture post-test points of the experimental group to whom digital portfolio assessment method was applied and the control group to whom traditional method was applied.

Table 8. Result of the Analysis Related To the Post-Test Scores Between The Experimental Group and Control Group

Sub-Components	Groups	n	$\overline{X}$	Std. Dev.	Leven's Test F	Leven's Test Sig.	df	t	p
Subject	Exp.	17	3.16	.80	.876	.354	50	3.02*	.048
	Control	35	2.62	.94					
Character	Exp.	17	3.22	.82	.078	.781	50	2.19*	.033
	Control	35	2.66	.87					
Stage setting	Exp.	17	3.16	.78	.080	.778	50	2.36*	.022
	Control	35	2.60	.80					
Conflict	Exp.	17	3.22	.90	.008	.931	50	2.18*	.033
	Control	35	2.62	.92					

*p<.05 Significance

According to the result of the *t*-test made between the post-test points of the experimental group and the control group, it is seen that there is a meaningful difference $[t(50) = 3.02 p < .05]$ in subject aspect, $[t(50) = 2.19 p < .05]$ in character aspect, $[t(50) = 2.36 p < .05]$ in stage setting aspect, $[t(50) = 2.18 p < .05]$ in conflict aspect (See Table 8). In this case, hypothesis 8 has been rejected. There has been more increase in the arithmetical mean of the experimental group than that of the control group. The acquired data reveal that digital portfolio assessment method improves the writing based on picture performances of the students more than the traditional assessment method.

Result and Discussion

The data of this research show that digital portfolio assessment improves the drawing and writing performances of the students more. It is also observed that the live discussion environments made with the students to determine digital portfolio assessment criteria have improved the cooperative working attitudes of the students. In addition, the studies made by the students to determine the criteria for the assessment rubric that the students

have prepared with their friends increased the level of knowledge about drawing and writing. It is also observed that this research carried out in an independent and non-threatening environment has developed the friendship attitudes and socialization of the students positively. Increase in the knowledge about drawing and writing and providing an independent environment for the students has also improved the creativity levels of the students.

The results of the research have indicated that digital portfolio assessment approach is effective in scoring the abilities of students to make up stories and draw pictures. However, it is vital that the rubrics of assessment that have been prepared should be reliable. In addition, the research has shown that compared to traditional approaches, teaching based on this approach is more efficient in the improvement of aforementioned skills. The process lasting from teachers' preparation of instructions with students to the presentation and evaluation of the works can be considered as a teaching.

The difficulties experienced by the students in developing digital portfolios emerged from two sources. One related to the software and the other to the digital portfolio itself. The main limitation reported by students in learning diaries associated with these subjects and in tutorial interactions was that associated with the use of information and communication technologies. They experienced difficulties learning how to use new software programs and were fearful of hardware failures that might ruin many hours of intensive work. The students' program of choice for the digital portfolios was Paint Brush, Microsoft PowerPoint and Word. These programs were seen as somewhat familiar and generally available on their home computers. Another difficulty arose as the size of the portfolios grew exponentially. They became very large, very quickly causing storage problems. Students had some difficulty creating multi floppy Zip files of their projects or in arranging for someone in their network of friends and family to burn their project to CD-Room. Availability of a common version of the program also presented numerous challenges. Such a finding has a parallel relationship with the findings of Woodward & Nanlohy (2004).

An increase in the performances of both the students of digital portfolio assessment process and the students of traditional plan in the way of the character, action, creativity and their aesthetics level identified for drawing. It is also found out that an increase in the performances of both the students of digital portfolio assessment process and the students of traditional plan in the way of the subject, character, stage setting and their aesthetics level identified for story writing. Such a finding has a parallel relationship with the findings of Tezci & Dikici (2004). It has been found out that the students applied portfolio assessment approach more creative. It can be stated that these findings have a parallel relationship with that of Druin et.al. (2003). Students of the each group have managed to produce creative products. It can be interpreted that the teaching and learning situation, which is non-threatening, has a positive effect on student creativity. Besides, this result obtained for creativity has given support to the ideas of Torrance (1995) and Olson (1999) claiming that assessment approaches and the interaction between student and teacher influence creative thinking capability of students. It can be considered that there is a decrease in exam anxiety.

CONCLUSION

The portfolio assessment, differing from tests, is based on the cooperation of the teacher and students in finding solutions to the problems. Searching for a solution to a problem in cooperation means to produce more suggestions for solutions. The individual learns how to analyze, synthesize and criticize the others' ideas while trying to make the others accept his/her ideas, which provides significant contributions to the critical thinking a lot. The portfolio assessment also contributes to the critical thinking of the students during their artistic studies.

Digital portfolio assessment is an assessment method that can be applied successfully both in teaching the subject and assessing the learned material. Apart from its positive effects on academic success, it also contributes to high self-confidence. Digital portfolio assessment method affects the development of children in various aspects positively apart from their learning skills.

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