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Influence of E-Portfolio Supported Education Process to Academic Success of the Students

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Abstract

Problem Statement: In recent years usage of e-portfolio in education has become the topic of many researches. In these researches it is generally emphasized the influences of e-portfolio to the learning attitude, academic success and usage of information technologies.

Purpose of Study: In this work the influence of e-portfolio supported education process to the academic successes of 10th grade students of Tekirdag Technical and Industrial Vocational High School has been studied. Within the scope of the research, e-portfolio supported education in test group in Vocational Development course and traditional in-class education was applied in control group in 2nd semester of 2010-2011 academic year.

Method: Control Group Trial Model with pretest and posttest was applied.

Findings and Results: While assessing the findings from the work it was benefited from SPSS 17.0 package program for statistical analyses. Kolmogorov-Smirnov normality test was applied in order to see whether the difference between pretests and posttests of test and control groups. In comparison of quantitative data t-test and Mann Whitney U test was used. **Conclusions and Recommendations:** According to the findings obtained at the end of the research, academic success posttest scores of the students in test group was higher comparing to that of students in control group. Based on these findings it was reached to the conclusion that e-portfolio supported education process influenced the success of students in positive way.

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1. Introduction

Education technologies are the leading among the factors directly effective on education and learning methods. Along with the development of education technologies learning, researching and homework preparation habits of the learners show difference. Internet and computer are the latest technologies used by the learners. Especially such tools as search engine, blog, forum, social network and e-portfolio presented by the internet have opened a quite different world of teaching and learning. Teachers also began to use these tools efficiently for measurement and assessment. The tool used widely to monitor the development of learners is e-portfolio.

Different from traditional portfolio it is easier in e-portfolio to send, access and re-arrange over internet. Its replication and reproduction takes less time. However its preparation might take longer time. Sometimes its preparation can be more expensive and even be more boring. Along with this preparation of e-portfolio is an effective way in showing learnt technology skills and gaining new skills (Heath, 2005).

Increasing in number, e-portfolios might include such files in different formats like text, graphic, video, sound, photograph and animation. Students can research the files in this format proportionally with their skills in using internet, can organize and can add to their e-portfolios (Fiedler&Pick, 2004).

Tolley (2008) made the definition of e-portfolio by reckoning its features. These features are given as the following:

1. *It is portable*: It is not embedded into any institution or registered virtual learning environment.
2. *It is personal*: It is 'owned' by the user and is customisable to the user's age, stage and style.
3. *It is generic*: It is not modelled on any particular curriculum delivery system nor content.
4. *It is Web 2.0*: It should be compliant with all generic formats within the application.
5. *It is MIS-free*: It is not under administration information system infrastructure of any institute.
6. *It is 'light'*: It is not a permanent repository of all of a user's files, rather a 'transit camp'.
7. *It is lifelong*: Ownership must be maintainable as a continuity, '5-95'.
8. *It lifewide*: It is capable of being used by all ages and abilities through a wide range of assistive templates.
9. *It is accessible*: It must recognize common standards of accessibility in terms of both outputs and inputs.
10. *It is Credible*: It supports digital safety standards determined by Bologna Process.

Considering above mentioned features it can be seen that e-portfolio has many benefits in terms of learners and teachers. Such features of it like it is compatible with Web 2.0 technologies, it can be arranged in custom and general mode, its content is variable, it can be used lifelong, it can be used in many places other than education, it is reliable and accessible enables easiness both for the learner and the teacher. For instance teachers may request from their students more sweeping and flexible works. They may request private works from each student and may provide better works with feedbacks. And learners would be able to easily record their works they made at any time in their lives whether these works are about education or business or private interest. Furthermore it can be accessed to rich contented works that include sound, graphics and video easily.

Many works have been made regarding the application of e-portfolio which is used at every segment of life to education. Erdogan (2006) researched the place and importance of assessment based on the portfolio. Furthermore student success of portfolio based assessment in foreign language education and the influence of the attitudes of students towards the course have been reviewed. At the end of the research it was found that portfolio had no influence towards the success and attitudes of students regarding the course yet it might have an influence on writing skills. On the other hand, when solving the answers given by students to ten questions it has been reached to the conclusion that they are content with e-portfolio application, they tried to produce better quality products, they took more responsibility regarding their training, they exhibited positive behavior towards learning yet much time consuming portfolio activities push them a lot and it is a compulsory that students should be trained regarding the formation and assessment of portfolio.

Kazan (2006) expressed that he aimed to set forth in detail how Electronic Development File applications can be used in Turkish Education System. At the end of the research it was determined that students had no anxiety regarding their marks, individuality and self-determination was achieved, they learnt to share, their self-reliance increased in the end of e-portfolio application. Ozyenginer (2006) made a research with 2nd grade students of the Department of Computer in Buca Anatolian Vocational High School and Vocational High School regarding the electronic portfolios which covers the 2005-2006 academic year fall semester. Within this one semester period students prepared an e-portfolio regarding the hardware course and at the end of the process they assessed themselves with electronic portfolio. At the end of the work all students passed and showed a success over the average (4,40 over 5). Cayirci (2007) examined the influence of Web Based Portfolio (WBP) on verbal and quantitative courses of primary school 7th grade students. At the end of the research it was revealed that WBP application increased the academic success of students on both verbal and quantitative courses yet it was seen that the increase of success in verbal courses (167,89) was higher than that of quantitative courses (83,29%) ($F(1; 66) = 62,028$ and $P = ,000$).

Erice (2008) researched the effects of electronic portfolio on students whose English language skills are at intermediate level. Based on data made before and after the application it was indicated that the students in electronic portfolio group were more successful in writing skills comparing to students who keep portfolio as file. Basciftci (2011) researched the influence of portfolio in “Journey to the Interior Structure of Living Things” which is primary school 6th grade Science and Technology course, to the success of the student and the durability of the knowledge. At the end of the research, benefiting from the portfolio in the teaching of Science and Technology course subjects increased students’ success, memory levels and attitudes towards Science and Technology lesson substantially. It was reached to the conclusion that usage of portfolio in science and technology course was more successful comparing to the usage of classical description method.

The purpose of the research is to provide the students studying in the fields of Information Technologies and Electricity- Electronics Technology in Tekirdag Technical and Industrial Vocational High School to efficiently learn the concepts and skills within the context of the course named Vocational Development and to make assessment by using e-portfolio at the end of education process. For this purpose primarily an e-portfolio interface was designed. Integrated to a social network (Facebook) this e-portfolio interface was opened to the access of students.

To sum up in this work it was aimed to examine how e-portfolio assessment process influences the success of students and to make a comparison of the processes in traditional in-class education and e-portfolio supported education processes.

Used in all fields of life, e-portfolio is also one of the current education technology tools. This work is regarded as important in terms of the subjects given below:

- E-portfolio usage in education.
- Influence of e-portfolio application process to the success of the secondary school students.

1.

2. Material and Method

2.1. Problem

In this work an e-portfolio applied education and assessment process was realized in order for the constitution of more meaningful and permanent education lives in Vocational Development Course. At the end of this process it was sought answers to below mentioned questions:

1. Does e-portfolio application used by integrating to Facebook social networking site in order to support conventional in-class education activities, have any contribution for students to learn the concepts and skills in Vocational Development course in a more efficient way?

2. Does e-portfolio application used by integrating to Facebook social networking site has any contribution for any change in behaviors of students towards e-portfolio in a more positive manner?

Research Model

In this study Pretest-Posttest Control Group Trial Model was used among experimental pattern types. The pretests used in the research were applied to students in the beginning of 18 weeks work and their academic presence was determined. After the research continued throughout the second semester of 2010-2011 academic year posttests were applied to students once again. Personal Information Questionnaire was filled by the students before the formation of the groups at the beginning of the research.

2.2. Population and Sample

Work group of the research is constituted of students of the Department of Information Technologies and Electricity-Electronic Technology who are in 10th grade in Technical and Industrial Vocational High School in the province of Tekirdag in 2010-2011 academic year. Tekirdag Technical and Industrial Vocational High School embodies 3 different school types. These schools are Industrial Vocational High School, Technical High School and Anatolian Technical High School. Application groups were randomly selected enabling researcher to control the application. While the groups are being constituted it was aimed to include students from different school types and different fields. Distribution of students according to their field, school type, class and group is given on Table 1.

Table 1 Distribution of students according to their field, school type, class and group

	Class	10-G	10-H	10-I	T-10B	AT-10A	AT-10B	
	School type	Industrial Voc. High School			Technical High Sch.	Anatolian Technical High Sch.		
Field	Group	Control	Control	Test	Control	Test		TOTAL
Information Technology				36		30		66
Electricity-Electronics Technology		41	37		32	26		136
TOTAL		114			32	56		202

114 students from Industrial Vocational High School, 32 students from Technical High School and 56 students from Anatolian Technical High School and totally 202 students attended to the application. 66 of the subjects were the students of Information Technologies and 136 of them were Electricity- Electronics Technology. While 92 of the students took place in test group on which e-portfolio supported education application was made, 110 of them took place in control group on which traditional in-class education was made. Only one of the students in control group was a girl. Distribution of test group according to the sex was shown on Table 2. As also seen on table all of the students studying in Electricity- Electronics Technology were male students. On the other hand 11 of the students in Information Technologies were female students while 81 of them were males.

Table 2 Distribution of test group according to sex

Sex	Female	Male
Field		
Information Technology	11	55
Electricity-Electronics Technology	0	26
TOTAL	11	81

2.3. Data Collection Tools

Personal Information Questionnaire: This questionnaire was constituted by the researcher to collect data regarding personal information, computer and internet and social network usage periods of students besides their demographic information.

Academic Success Test: Developed by the researcher, this test was used to determine readiness levels of students and their academic success levels after the application. For this test, Personal Development and Communication in Business Life modules determined by the Ministry of Education were used as a resource. 41

questions were prepared to include the determined targets. This 41 questions of multiple choice test was applied to 400 students who studied Vocational Development course in 2009-2010 academic year. Article difficulty and article distinctive values were determined to find out the questions to be included in academic success test among the prepared questions. Considering the 12 articles whose distinctive values were less than 0,2 and the targets prepared in the beginning of the application and also considering the article distinctive values and difficulty indexes 4 articles and totally 16 items of articles were removed from the test. As a result, Academic Success Test which is used to determine the presence level of the students before the education and to determine the efficiency of the application after the education was totally constituted of 25 articles.

2.4. Collection of Data

While certain part of the questionnaires and scales used in the research was realized paper-based, the other part of it was made by using Google survey tool. Paper based data were transferred to electronic environment by using Google survey tool and saved to MS Excel environment.

2.5. Analysis of Data

While assessing the data obtained from the work SPSS 17.0 package program was used for statistical analysis. Kruskal Wallis test was used in the inter-group comparison parameters that show abnormal distribution in the case of quantitative data when there is more than two groups and Mann Whitney U test was used in determination of the group that cause difference. Results were dually assessed within 95% range and at $p < 0,05$ significance level.

3. Findings and Results

In this section of the research, quantitative and qualitative data obtained as a result of experimental studies were interpreted in line with goals.

Regarding the problems; pretest and posttest results of the academic success test of the test and control groups were given in Table 3.

Table 3 Academic success test results of test and control groups

	Test		Control		t	p
	Average	Ss	Average	Ss		
Academic Success (pretest)	60,696	12,905	50,764	14,856	5,021	0,000**
Academic Success (posttest)	70,935	12,675	62,655	14,297	4,315	0,000**
p	t= 7,59; 0,000**		t= 7,83; 0,000**		**p<0,01	

As a result of t-test made in order to determine whether the academic success (pretest) score averages of the attendants of the research showed a significant difference or not, the difference between group averages was statistically found to be significant ($t=5,02$; $p=0,000 < 0,05$). Academic success (pretest) scores of the students in test group were found to be higher than the academic success (pretest) scores of the students in control group.

As a result of t-test made in order to determine whether the academic success (posttest) score averages of the attendants of the research showed a significant difference or not, the difference between group averages was statistically found to be significant ($t=4,31$; $p=0,000 < 0,05$). Academic success (posttest) scores of the students in test group were found to be higher than the academic success (posttest) scores of the students in control group. The graph belonging to the academic success pretest and posttest results of the students in test and control group is given in Fig. 1.

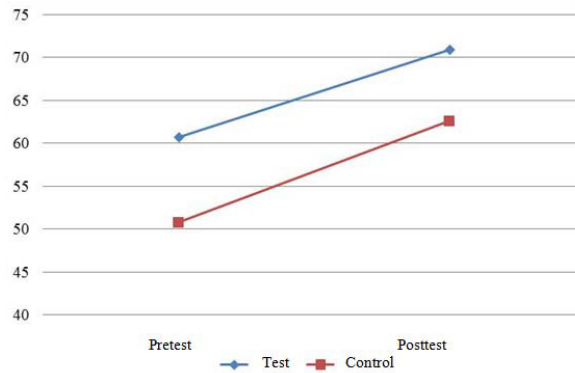


Fig. 1. The graph regarding the academic success pretest and posttest results of the students in test and control group

In order to see whether the difference between pretest and posttests of test and control groups firstly Kolmogorov-Smirnov normality test was applied. As a result of the test ($p < 0.05$, $p = 0.016$) it was seen that the difference was abnormal. For this reason, as a result of Mann Whitney U test made in order to determine whether the difference between the results of academic success pretest and posttest results of test and control groups was significant or not, no significant difference was found.

Even though the results obtained regarding the problem of the research were not statistically significant, examining the higher academic success posttest scores of the students in test group it can be said that e-portfolio supported education process influenced the success of the students positively.

While this result corresponds to the results of certain works it shows difference with some. With the works of Ozyenginer (2006), Kazan (2006), Cayirci (2007), Erice (2008) and Basciftci (2011) it was seen that academic success of the students studied with the help of e-portfolio was higher than that of students studying with traditional method. The work of Erice (2008) was applied to English course and it was reached to the conclusion that e-portfolio increased the writing skills of students. The work of Cayirci (2007) which deals with whether the selection of quantitative or verbal course is important in e-portfolio application is remarkable. In this work the application was made in Vocational Development course which is a verbal lesson. However in the application of Cayirci the courses of Science and Social Sciences were selected. At the end of the research academic success of the students in both e-portfolios supported courses were higher than that of those studying in traditional methods and it was seen that the increase of success in verbal course was higher than that of quantitative course. It is also a matter of question for what type of courses –verbal, quantitative- would the e-portfolio applications can be more fitting. In the work Erdogan (2006) it is seen that there is no significant difference between the academic success and attitudes of students who either study with e-portfolio support or who study with traditional methods. The reason why the results of the work applied to English course in the preparation class of Maltepe Military High School and the results of this work is that because students study English intensely in preparation classes and unless they succeed there is a risk of dismissal from the school.

E-portfolio applications are not just related to the academic features of the students. Besides enhancing their knowledge it also supports the enhancement of students' perception and skills. Not only the information and skills regarding the course selected in e-portfolio applications but their information and skills regarding the information technologies also show improvement.

4. Conclusions and Recommendations

E-portfolio is an archive in which executed works are stored and exhibited. It is thought that this feature of e-portfolio might have drawn the attention of students. While the percentages regarding the fulfillment of homework in traditional education and students' interest level regarding these homework are pretty low, in e-

portfolio application the interest showed to homework are is pretty high. While the students especially those studying in industrial vocational high schools showed reckless attitude regarding the homework, it is observed in this study that a pretty high feedback was taken in this work.

The following should be taken into consideration when using e-portfolio in education:

- Compatibility of the application with course content and goals should be taken into consideration.
- Students' information technologies literacy levels should be determined beforehand.
- Compatibility of the works requested from the students with their education levels, their information technologies usage skills and the goals of the course should be taken into consideration.
- Students' attitudes towards the applications should be determined beforehand.
- Application process should be described to the student in best manner considering especially those who behave negatively.
- During the application good and bad works should be shared with students in certain periods and certain mistakes should be corrected.
- Assessment criteria of the works should be determined in a well manner.
- In order for the students to assess the works of each other different criteria should be determined and should be motivated regarding the assessment of the works of each other.
- Group works should be promoted and while determining the works to be made during the application period it should be paid attention for the presence of at least one group work.
- An environment to which students may attend to the application other than their homes and technological infrastructure should be provided.

The suggestions for those who shall make research and application regarding the usage of e-portfolio in education are given below.

- 1) Sample e-portfolios can be reviewed for e-portfolio design.
- 2) Works can be made regarding the usage of e-portfolio applications in vocational education and especially in the field of information technologies.
- 3) The usage of e-portfolio in primary, secondary and higher education can be researched.
- 4) Advantages and disadvantages of e-portfolio application can be set forth by reviewing previous application results.
- 5) Convertibility of e-portfolio applications to a corporate format can be examined.

* This study was prepared by practicing upon the Doctorate thesis of Mehmet Fatih BARIS titled “*Integration of The E-Portfolio into a Social Network and Analysis of Results*”.

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