

Full Length Research Paper

The study on electronic portfolios in vocational education: The views of teachers and students in United Kingdom, Denmark, Romania and Turkey

Muhammed Turhan^{1*} and Cihad Demirli²

¹Department of Educational Sciences, College of Education, Firat University, 23119, Elazig, Turkey.

²Department of CEIT, College of Education, Firat University, 23119, Elazig, Turkey.

Accepted 12 May, 2010

This paper comprises teachers' and students' e-portfolio views involved in vocational education in Europe. In addition, it is a part of the final report of the project entitled "E-Portfolio Process in Vocational Education" within Leonardo da Vinci Procedure B Pilot project. Questionnaires were administered on 387 students and 73 teachers in Turkey, United Kingdom, Denmark, and Romania. The results suggested that both teachers and students find the e-portfolio process necessary in vocational education. The process was particularly reported to be helpful in putting theoretical knowledge to use, making use of various types of evidence for student learning, encouraging continuous student development, and actively using self-evaluation and information and computer technologies in instruction.

Key words: Electronic portfolio, vocational education, lifelong learning.

INTRODUCTION

Improvements on science and technology offer new possibilities to the vocational education. Furthermore, developments in the pedagogy lead researchers to yield new approaches of relationships among student, teacher, content, environment, and technology. Vocational educators are concerned with preparing students for the expectations of the workplace. For this reason, a production is expected from learners in learning process in vocational education. Both production processes (learning) and products have same important sense in learning process. Success of learning process and product are exposed through assessment which stresses

holistic relationship between learning and assessment processes. However, existing learning and assessment approaches consider learning and assessment as different processes. On the other hand, according to new approaches, learning and assessment are not the processes that follow each other. Therefore, learning and assessment cannot be seen apart from each other.

Portfolio is an alternative form of learning and assessment that is particularly attractive to vocational educator because it includes the assessment of active learning and performance rather than the mere recall of memorized facts. It serves the interests of business and industry as well by forging a connection between activities in the classroom and real life. However, the successful achievement of these anticipated outcomes depends upon the purposes, practices and structures that guide implementation of this new form of learning and assessment in vocational education. In this point, usage of e-portfolio in the vocational education is a new subject in the scope of these new approaches.

E-portfolio approach is to provide collaboration of the

*Corresponding author. E-mail: mturhan@firat.edu.tr. Tel: +904242370000. Fax: +904242365064.

Abbreviations: EPVET, Electronic portfolio process in vocational education and training; VET, vocational education and training.

people concerned in vocational education (employers, workers, other learners, faculty members etc.) since, evidence showing the improvements in learning can be collected in electronic forms. Learners can connect with employers, workers, other learners, and faculty members through special instruments during e-portfolio process. Usage of e-portfolio is to improve access opportunities to vocational training and quality of continuing vocational training.

E-portfolio is learning and assessment process in which individual production is privileged, improvement is always highlighted in the learning process, depending on authentic learning situations, maintaining multiple participations in the students' academic improvement and displaying self confidence and latent powers of students. Its usage will increase efficiency and instructional performance in the vocational education.

The Leonardo da Vinci programmed is a vocational education program of European Commission. It links policy to practice in the field of vocational education and training (VET). Projects range from those giving individuals has the chance to improve their competences, knowledge and skills through a period abroad, to Europe-wide co-operation between training organizations. EPVET (Electronic Portfolio Process in Vocational Education and Training) was a two-year project within the Leonardo da Vinci Programmed Procedure B. The main aim of the project was to develop and generalize use of e-portfolio approach in vocational education in Europe. The objectives of the Project were;

- (i) To report present applications related to web-based training, portfolio, and e-portfolio in vocational education in Europe,
- (ii) To construct an e-portfolio framework that would be used by trainers for designing e-portfolio processes in different fields of vocational education,
- (iii) To develop web-based learning materials to teach learning and assessment approach of e-portfolio and its usage in vocational education,
- (iv) To design sample e-portfolio processes for different professions in vocational education and to apply them on target groups, and
- (v) To report results related to application of e-portfolio in vocational education.

A learning approach that is flexible, individual and learner-centered was developed in EPVET Project. In addition, the EPVET project provided more effective use of information and communication technologies in vocational training and developed innovation and quality in vocational training.

The main aim of the paper is to present results of the use of e-portfolio in vocational education in the scope of the EPVET Project. In this sense, objectives of the paper are;

- (i) To provide an analysis of current situation on learning

needs related to e-portfolio approaches and

- (ii) To analyze participants' views comparing with their personal characteristics.

Electronic portfolios

Recent advances in computer technologies have contributed to the traditional pen-and-paper portfolios by carrying them to the electronic environment. In addition, having all the advantages of traditional portfolios, electronic portfolios present a richer and more comprehensive picture of learner improvement. Stating that e-portfolios reflect a complete view of learning and improvement over time, Chang (2001) defines them as a computer-readable form of all artifacts.

Etymologically, the word portfolio is made of the combination of the Latin words "portare" (to carry) and "folium" (paper, sheet) into the Italian word "portafoglio", and then transferred into English as "portfolio" (OED, 2007). The use of portfolios in daily life is not a new phenomenon. Portfolios were introduced in the field of education as an instructional tool in the 1970s (Reckase, 1995; Danielson and Abrutyn, 1997; Underwood and Murphy, 1998; Callahan, 1999; Lawrenz et al., 2000; Briscoe and Wells, 2002). Since then, the use of portfolios has become common in teaching.

Various definitions of portfolios are possible as they have different features depending on their aims and uses. However, a general definition of portfolios used in education was given by Paulson et al. (1991: 60): "a purposeful sum of learner works reflecting their efforts, improvement and successes". In another effort, Arter (1990: 27) defined a portfolio as a purposeful accumulation of the evidence of student efforts and successes reflecting selection and assessment criteria. In addition to these definitions, it should be said that educational portfolios reflect the development of cognitive gains and mainly serve to document student learning (Danielson and Abrutyn, 1997: 5).

With the use of portfolios, clearer data is collected about the improvement of the learners and learners are encouraged to contribute to the decisions made during this process of change. At the same time, learners are given new ways to display their successes and talents (Demirli, 2007). For these reasons, portfolios include not only the products of learners' academic studies but also their reflections on learning (Piantanida and Garmen, 1997: 4). By doing so, portfolios contribute to the implementation of reflective pedagogy which is considered so important in our day as to inspire different models (Kuit et al., 2001; Hooijberg et al., 1997), and they also help the development of future teachers (Senne, 2003). With e-portfolios, the contextual dimension of work is presented more effectively and monitoring is made easier. Additionally, the process continually supports cooperation between teachers and students (Tezci and Dikici, 2002). Therefore, it can be argued that e-portfolios allow for

communication with learners in different ways.

Students can reflect their continuous development and change by supporting their portfolio documents with multimedia features such as pictures, graphics, sounds, films, animations, and texts. This means that students are able to materialize educational development in a more portable format (Pullman, 2002:152). Naturally, this is not a random collection of learner work (Barrett, 2000). On the contrary, e-portfolio presumes that students will purposefully select pieces of work and bring them together by using different tools in electronic media (Buzzard and Kaunitz, 2001). This eases the portfolio process and gives learners more options (Tezci and Demirli, 2004). However, the process of the traditional and technology enhanced portfolios needs to be distinguished from each other. The main difference is that, e-portfolios support the technological skills of learners and their life-long learning; they help artifacts to be stored and carried more easily; and they reduce the need for portfolio storing space.

The literature cites different types of portfolios depending on their aims and uses (Danielson and Abrutyn, 1997; Rybacki and Lattimore, 1999; Rolheiser et al., 2000; Bers, 2001; Briscoe and Wells, 2002). However, these types may look different in theory; they are all related in practice. These types may be used together to fulfill different aims. For this reason, it is important for educators to clearly state their aims in using portfolios, to choose the right type of portfolio, and to involve the learners as much as possible.

Business, presentation and evaluative portfolios

Portfolios are classified according to the purposes they serve. Such categorization commonly leads to three different types of portfolios: business portfolios, presentation portfolios, and evaluative portfolios (Danielson and Abrutyn, 1997:2 - 8). Business portfolios are used to reflect learner improvement within a process. They are called business portfolios as they store all pieces of work created within the process. However, these portfolios are not aimless collections of information because they involve a controlled selection process which is not limited to learners' best work.

Presentation portfolios include learners' best work. They aim to reflect the highest level of learner accomplishment. They thus, contain the pieces of work that document learner's success within the process. Evaluative portfolios are another type of portfolios. The major aim of these is to document learners' attainments. In this case, the contents of the instructional program determine the contents of the portfolio as well.

Documentation, process, and showcase portfolios

Another common categorization of portfolio types is as follows: Documentation Portfolios, Process Portfolios,

and Showcase Portfolios (Prince George's Country Public Schools, 2004). Despite different names, these types of portfolios are very similar to the ones mentioned above. Documentation portfolios are also known as business portfolio, contain reflections on learner's attainments and those pieces of work that document learner's success over time.

Process Portfolios include all stages of learning processes and are especially useful in documenting learners' entire learning processes. They aim to reflect how learners' particular knowledge and skills are incorporated from basic to advanced management. Showcase portfolios contain learners' best work so that learner's selections and reflections can be evaluated against program outputs. Learners and teachers together decide what should go into a showcase portfolio.

Best work portfolios and developmental portfolios

In addition to the categorizations mentioned above, two other categories exist, which are known as best work portfolios and developmental portfolios (Rolheiser et al., 2000: 4-5). Best work portfolios include the evidence of learners' best and outstanding work. They are also known as presentation or showcase portfolios. Developmental portfolios present individual development over time. Such development may be in academic or cognitive skills, content knowledge or in another area.

METHODS

The study made use of separate questionnaires for students and teachers. While developing the questionnaires, critical elements of the e-portfolio approach were identified and the items were written accordingly. These critical elements are:

- (i) Using activities that support continuity within the learning process,
- (ii) Putting theoretical knowledge to use within the learning process,
- (iii) Creating a unique learning atmosphere for individual students throughout the learning process,
- (iv) Assessing learning not only through tests and quizzes, but, also various types of evidence such as projects, pictures, or photographs,
- (v) Offering developmental feedback in the assessment of learning rather than classifying students as successful or not,
- (vi) Involving students in the process of identifying learning objectives,
- (vii) Taking into account students' performances or work (products, reproductions, artifacts) in assessment,
- (viii) Using strong evidence about students' efforts in assessment,
- (ix) Encouraging student to do self-evaluations in the learning process,
- (x) Allowing students to display learning outcomes that they find important,
- (xi) Supporting collaboration and participation in the learning process,
- (xii) Empowering students during the learning process by giving them responsibilities,
- (xiii) Using information and computer technologies effectively in the learning process,
- (xiv) Using the learning process as a source of encouragement and

motivation for students,
 (xv) Using both quantitative and qualitative data in assessment,
 (xvi) Developing a sense of ownership in the students for the work created within the learning process, and
 (xvii) Involving others including employers, parents, subject area specialists, sector workers, and peers in the learning process.
 These critical elements were used to create an 18-item questionnaire and arranged into two different formats for teachers and students. The questionnaire was given to 387 vocational students and 73 vocational teachers in four different countries (Turkey, UK, Denmark, and Romania). The obtained data were analyzed by using statistical software. During the data analysis process percentages, frequencies, and arithmetic means were calculated and t test and variance analysis techniques were employed

FINDINGS AND DISCUSSIONS

This section is dedicated for the findings and discussions. Personal characteristics of participants Descriptive data for participants' demographic information in terms of nationality, gender and professional experience are shown in Table 1. Table 1 show that a total of 460 individuals, 73 teachers and 387 students, participated in the study. The biggest participation was from Turkey. Table 2 shows that 78.5% of participants were male and 21.5% were women. It can be seen that, the majority of participants were male. According to Table 3, more than half of the participants had 1 - 10 years of professional experience.

Findings about teacher and student views about the e-portfolio process

In this section findings were given about teachers' and students' views about the E-portfolio process. Following the table presents the arithmetic means and standard deviations of participant teachers' answers on questionnaire items. Table 4 shows that the participant teachers strongly agreed with a big majority of the questionnaire items. The teachers seemed to agree with the items that claimed the e-portfolio process helps putting theoretical knowledge to use; student assessment should take into account a big array of evidence; student development requires continuous development activities; assessment should take into account of student performances and effort; collaboration and participation are important in the learning process; and information and computer technologies need to be used effectively in the learning process. As a result, it seems that the participating teachers believed in the benefits of e-portfolio in vocational education.

Table 5 shows the arithmetic means and standard deviations of participating students' answers to the items in the questionnaire. Table 5 shows that the students strongly agreed with a big majority of the questionnaire items, indicating that these students believed in the benefits of e-portfolio applications in vocational education. The means of teacher and student responses to the 18 items

Table 1. Descriptive statistics for participants' nationality.

Country	Instructor		Student		Total	
	N	%	N	%	N	%
Turkey	22	30.2	174	45*	196	42.6
Denmark	33	45.2*	159	41.1	192	41.8
Romania	7	9.6	24	6.2	31	6.7
UK	11	15	30	7.7	41	8.9
Total	73	100	387	100	460	100

Table 2. Descriptive statistics for participants' gender.

Gender	N	%
Male	361	78,5
Female	99	21,5
Total	460	100

Table 3. Descriptive statistics for participants' professional experience.

Professional experience	N	%
1-10 years	38	52,1
11-20 years	19	26,0
21-30 years	16	21,9
Total	73	100

show that the level of agreement was very high. It may thus, be claimed that e-portfolios will bring a new perspective to vocational education. Table 6 shows the t-test results of participating teachers' and students' views. The table shows that a meaningful difference exists in items 1, 2, 9, 10, 11, 13, 18. The findings for these items are described below. The item "*Application of theoretical knowledge provides me assistance in the learning process*" (Item 1) presents a meaningful difference between teachers and students. Teachers seemed to believe more strongly that theoretical knowledge needs to be put in use. The item "*Assessments of learning should be done by using every type of artifacts such as projects, drawings, pictures, which has shown students' learning as well as using results of tests and quizzes*" (Item 2) also presents a meaningful difference between teachers and students. Both teachers and students answered this item as "strongly agree" however, teachers' means were higher than students'. Although, on the behalf of teachers a significant difference was found on the item "*The learning medium which is peculiar to us has to be provided in the learning process*" (Item 9), both participant groups responded as "agree". On the item "*I want to exhibit the learning products which are considered important for me in the learning process*" (Item 10),

Table 4. Participant teachers' views about the critical elements of the e-portfolio process.

It.N.	Items	N	Mean	Std. Dev.
1	Application of theoretical knowledge provides assistance to the learner in the learning process	73	4.60	0.59488
2	Assessments of learning should be done by using every type of artifacts such as projects, drawings, pictures, which has shown students' learning as well as using results of tests and quizzes	73	4.65	0.50605
3	Activities providing continuity in the student development have been also replaced in the learning process	73	4.49	0.60377
4	Feedback reflecting the development in the assessment of students should be given instead of classification either merely successful or unsuccessful	73	4.36	0.65631
5	Learners' learning goals should be able to determine by their contribution.	73	4.05	0.91120
6	Strong evidences related to learners' struggle in the learning process should be used during the evaluation	73	4.26	0.79978
7	Learners' performance or studies related to the work done by themselves such as products, reproductions, artifacts etc. have to be considered during the evaluation	73	4.43	0.66638
8	Self-assessment has to be provided in the learning process	73	4.16	0.78198
9	The learning medium which is peculiar to learners has to be provided in the learning process	73	4.19	0.75751
10	Learners can be able to exhibit the learning products which are considered important for themselves in the learning process	73	4.20	0.76301
11	Collaboration and participation during the learning process have to be supported	73	4.52	0.50303
12	Both responsibility and power have to be provided to student during students' learning process	73	4.21	0.67178
13	The learning process must serve to both learners' and teacher's evaluation goals	73	4.35	0.73352
14	Learning process should help learners for encouragement and motivation.	73	4.58	0.52270
15	Both quantitative and qualitative data have to be considered during the evaluation of learners	73	4.21	0.83743
16	Contributions of various people such as employers, parents, subject area specialists, peers etc. have to be provided in learners development	73	4.13	0.87106
17	Effective usages of information and computer technologies have to be provided in the learning process	73	4.54	0.57834
18	Learners should claim the products which produced in their learning process	73	4.05	0.98447

both teachers and students responded as "agree". Both teachers and students responded to the item "Collaboration and participation during the learning process have to be supported" (Item 11) as "strongly agree". While, teachers strongly agreed with the item "The learning process must serve to both learners' and teacher's evaluation goals" (Item 13), students responded as "agree". This interesting finding may be because participating teachers were genuinely willing to share their power and participation with the students throughout instruction and assessment. On the item "I would like to claim the products which produced in my learning process" (18), students responded as "strongly agree" whereas, teachers said "agree". This suggests that the participating students were willing to have ownership of their own work. It is an important finding that both teachers and students agreed with the majority of the questionnaire items. This suggests that teachers and students have common beliefs about the use of e-portfolios in vocational education.

The variance analysis results of teacher views on e-

portfolio use with respect to their work experience have been shown in Table 7. It can be seen from the table that teachers in different experience groups thought differently on the 3rd and 8th items. All groups responded to the item "Activities providing continuity in the student development have been also replaced in the learning process" (Item 3) as "strongly agree". However, the analyses showed a meaningful difference between teachers with 21 years or more experience and those with 1 - 10 years experience. Those in the former group agreed more that, instruction should include activities supporting continuity. It is an interesting finding that more experienced participating teachers believed this more than the less experienced ones did. While teachers with 1 - 10 years experience responded to the item "Self assessment has to be provided in the learning process" (Item 8) as 'agree', teachers in the other two groups responded as "strongly agree". This shows that more experienced teachers believe more strongly in the importance of student self-evaluation in the learning process. The finding that teachers with varying degrees of experience agreed with

Table 5. Views of participant students about the critical elements of the e-portfolio process

It.N.	Items	N	Mean	Std. Dev.
1	Application of theoretical knowledge provides me assistance in the learning process	387	4.42	0.79636
2	Assessments of learning should be done by using every type of artifacts such as projects. Drawings, pictures. which has shown students' learning as well as using results of tests and quizzes	387	4.49	0.71029
3	Activities providing continuity in the student development have been also replaced in the learning process	387	4.42	0.66491
4	Feedbacks reflecting the development in the assessment of students should be given instead of classification either merely successful or unsuccessful	387	4.42	0.75973
5	Our learning goals should be able to determine by our contribution.	387	4.13	0.91298
6	Strong evidences related to my struggle in the learning process should be used during the evaluation	387	4.07	0.84555
7	Our performance or studies related to the work done by ourselves such as products, reproductions, artifacts etc. have to be considered during the evaluation	387	4.38	0.68553
8	Self-assessment has to be provided in the learning process	387	4.04	0.89205
9	The learning medium which is peculiar to us has to be provided in the learning process	387	3.95	0.94312
10	I want to exhibit the learning products which are considered important for myself in the learning process	387	3.65	1.02799
11	Collaboration and participation during the learning process have to be supported	387	4.37	0.78592
12	Both responsibility and power have to be provided during our learning process	387	4.26	0.77200
13	The learning process must serve to both learners' and teacher's evaluation goals	387	3.95	0.94686
14	Learning process should help our encouragement and motivation.	387	4.46	0.68353
15	I expect to be considered from the point of both quantitative and qualitative data during the evaluation	387	4.34	0.77794
16	Contributions of various people such as employers, parents, subject area specialists, peers etc.. has to be provided in our development	387	4.15	0.83229
17	Effective usage of information and computer technologies has to be provided in the learning process	387	4.57	0.67265
18	I would like to claim the products which produced in my learning process	387	4.44	0.77153

almost all the items that's worth noting. This shows that, regardless of work experience, all teacher groups believed in the importance of the e-portfolio process.

DISCUSSION

Both teachers and students who participated in this project in four different countries have similar thoughts about the use of the e-portfolio process in vocational education and perceive it as necessary for success in education. Teachers and students also believe that theoretical knowledge should be put to use, various types of

evidence should be used in assessments, activities supporting continuity in student development should be used, collaboration and participation is important, encouraging the students and motivating them are necessary, and computer and information technologies need to be used effectively.

The t-test results found meaningful differences on certain items; however, the difference was not high. Teachers and students seemed to share common views about using e-portfolios in vocational education and believed that it should be used. The variance analysis results with respect to teachers' experience showed meaningful difference between certain items as well.

Table 6. t test results of participating teachers' and students' views.

It.	Particip.	N	Mean	Sd	t	p
1	Student	387	4.42	0.796	-2.158	0.03*
	Teacher	73	4.60	0.594		
2	Student	387	4.49	0.710	-2.327	0.02*
	Teacher	73	4.65	0.506		
9	Student	387	3.95	0.943	-1.154	0.04*
	Teacher	73	4.19	0.757		
10	Student	387	3.65	1.027	5.357	00*
	Teacher	73	4.20	0.763		
11	Student	387	4.37	0.785	-2.086	0.03*
	Teacher	73	4.52	0.503		
13	Student	387	3.95	0.946	-3.465	0.00*
	Teacher	73	4.35	0.733		
18	Student	387	4.44	0.771	3.244	0.00*
	Teacher	73	4.058	0.984		

*p<.05

Table 7. Variance analysis results of the work experience variable for teachers (Turkey, United Kingdom, Denmark and Romania).

It.	Work Exp.	N	Mean	Std Dev.	F	p	Lsd
3	1 - 10 years	38	4.31	6.19	3.873	0.025*	1 - 3
	11 - 20 years	19	4.63	4.95			
	21 years or more	16	4.75	5.77			
8	1 - 10 years	38	3.89	7.27	5.618	0.005*	1 - 2, 1 - 3
	11 - 20 years	19	4.36	8.30			
	21 years or more	16	4.56	6.29			

*p<.05

More experienced teachers agreed with these items more than less experienced ones did. However, a complete analysis of the items showed that all teachers responded favorably to the items.

The study results seem to indicate that the e-portfolio process is considered to be necessary by both teachers and students. Aiming for continuous learning and development and emphasizing the process of learning, the e-portfolio will add a new dimension to vocational education in Europe. With the new understanding of assessment brought by the e-portfolio, both teachers and students will be presented with a chance for lifelong learning. Therefore, it is crucial that the e-portfolio approach has been incorporated into vocational education. Both teachers and students who participated in this research have similar

thoughts about e-portfolio and perceive it as necessary for the success of education. The study results seem to indicate that the e-portfolio is considered to be a promising approach by both teachers and students. Aiming for continuous learning and development and emphasizing the process of learning, the e-portfolio will add a new dimension to vocational education. With the new understanding of assessment and learning brought by the e-portfolio, both teachers and students will be presented with a chance for lifelong learning.

REFERENCES

Arter J (1990). Using Portfolios in Instruction and Assessment: State of the Art Summary. Portland: Northwest Regional Educational

Laboratory.

Barrett HC (2000). Create Your Own Electronic Portfolio. *Learning Leading Technol.*, 27(7): 14-21.

Bers TH (2001). Measuring and Reporting Competencies. *Competency-Based Learning Models in Higher Education*, New Directions. Institut. Res., 1(10):29-40.

Briscoe C, Wells E (2002). Reforming Primary Science Assessment Practices: A Case Study of One Teacher's Professional Development through Action Research. *Teach. Res.*, 86: 417-435.

Buzzard J, Kaunitz P (2001). Electronic Portfolio Design. *Mid-South Instructional Technology Conference (Sixth Annual)*, April 8-100, 2001. Retrieved March 16, 2007 from the World Wide Web: <http://www.mtsu.edu/~itconf/proceed01/20.pdf>

Callahan S (1999). All Done with Best of Intentions: One Kentucky High School after Six Years of State Portfolio Tests. *Assessing Writing*, ISSN: 1075-2935, 6(1): 5-40.

Chang C (2001). A Study on the Evaluation and Effectiveness Analysis of Web-Based Learning Portfolio (WBLP). *British J. Educ. Technol.*, 32 (4): 435-458.

Danielson C, Abrutyn L (1997). An Introduction to Using Portfolios in the Classroom. Alexandria, Virginia. USA: Association for Supervision and Curriculum Development.

Demirli C (2007). Elektronik Portfolyo Öğretim Sürecinin Öğrenen Algılarına ve Tutumlarına Etkisi (Yayınlanmamış Doktora Tezi). Elazığ: Fırat Üniversitesi Sosyal Bilimler Enstitüsü.

Hooijberg R, Bailey JR, Saparito P, Kressel K, Christensen E (1997). A Model for Reflective Pedagogy. Retrieved February from the World Wide Web: *J. Manage. Educ.*, 155: 11-21., <http://jme.sagepub.com/cgi/content/abstract/21/2/155>

Kuit J, Reay G, Freeman R (2001). Experiences of Reflective Teaching. *Active Learning in Higher. Educ.* 2 (2):128-142.

Lawrenz F, Huffman D, Welch W (2000). Policy Considerations Based on a Cost Analysis of Alternative Tests Formats in Large Scale Sciences Assessments. *J. Res. Sci. Teach.*, 37(6): 615-626.

OED (2007). Online Etymology Dictionary. Retrieved March 13, 2007 from the World Wide Web: <http://dictionary.reference.com/browse/portfolio>

Paulson FL, Paulson PR, Meyer CA (1991). What Makes A Portfolio, A Portfolio?. *Ed.cLeadership*, pp. 60-69.

Piantanida M, Garmen N (1997). Portfolio Making in the Classroom. Report of Active Learning Project. Pennsylvania: University of Pittsburgh.

Prince George's Country Public Schools (2004). What are Some Different Types of Portfolios?. Prince George's Country Public Schools Web Site. Retrieved July, 10, 2004 from World Wide Web: <http://www.pgcps.pg.k12.md.us/~elc/portfolio2.html>

Pullman G (2002). Electronic Portfolios Revisited: The Efolios Project. *Comput. Composit.*, 19: 151-169.

Reckase MD (1995). Practical Experiences in Implementing a National Portfolio Model at the High School Level. *National Association of Secondary School Principals (NASSP) Bulletin*, 79, 31-36. Retrieved February 11, 2007 from the World Wide Web: <http://bul.sagepub.com/cgi/content/abstract/79: 573-31>.

Rolheiser C, Bower B, Stevahn L (2000). The Portfolio Organizer Succeeding with Portfolios in Your Classroom. Alexandria, Virginia. USA: Association for Supervision and Curriculum Development.

Rybacki D, Lattimore D (1999). Assessment of Undergraduate and Graduate Programs. *Public. Relations. Rev.*, 25(1): 65-75.

Senne TA (2003). Portfolio Development as a Three-Semester Process: The Value of Sequential Experience. Paper presented at the Annual Meeting of Am.Edu. Res. Assoc. Chicago, IL, USA. April. 21-25.

Tezci E, Demirli,C (2004). Bir Performans Değerlendirme Modeli: Bireysel Gelişim Dosyası. XIII. Ulusal Eğitim Bilimleri Kurultayı, 6-9 Temmuz 2004, İnönü Üniversitesi, Eğitim Fakültesi, Malatya.

Tezci E, Dikici A (2002). "Oluşturmacı Uzaktan Öğrenmede Değerlendirme Yaklaşımları: Bir Dijital Portfolio Değerlendirme Örneği" Uluslararası Katılımlı Açık ve Uzaktan Eğitim Sempozyumu, , Anadolu Üniversitesi, Eskişehir. Bildiriler CD'si. 23-25.

Underwood T, Murphy S (1998). Interrater Reliability in a California Middle School English/Language Arts Portfolio Assessment Program. *Assessing Writing*, ISSN: 1075-2935, 5(2): 201-230.