

Digital Assessment Tool: E-Portfolio

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Portfolio is one of the alternative assessment approaches commonly used in education today. A portfolio is a product file, a skill set or a knowledge base that is kept in a certain period of time, which includes the picture, sketch, poem, story, project or academic writings that a student has prepared and shows the level of development. Portfolio is a performance measure in which the student creates the content according to himself and allows him to organize in a way that he can improve on a certain skill set. It can also be used as an assessment method to measure a student's progress in a certain subject in a certain period of time (Filkins, 2010). Portfolio represents the whole of the work done at the end of a certain process (Larson, 2003). Portfolios can be defined as product files in which students display their work and achievements throughout the process (Paulsen & Meyer, 1991). As stated by Chen and Mazow (2002), a portfolio is a collection that shows a student's progress, efforts and achievements in one or more areas.

Guskey (2003) and Ada, Tanberkan Suna, Elkonca and Karakaya (2016) define portfolio as an evaluation tool that brings together the process and product, where both the learning process and the learning product are important. In the process of creating portfolios, students can choose and evaluate their own learning products (Barrett, 1998). In addition, portfolios are not only a learning method but also an opportunity for evaluation (Wiggins, 2004). Many researchers (Gibson, 2006; Guskey, 2003; Karakaya, 2015; Stevenson, 2006) explained the features of portfolio evaluation as follows: They state that portfolios are folders where systematic, purposeful and meaningful student collections are collected in one or more subject areas. On the other hand, Barrett (1998) described a portfolio as a curriculum vitae whose contents could be defined by the student or teacher, a representative example of overall performance, or an ever-changing exhibition, with a primary focus on documentation or assessment. Gibson (2006), emphasizing the learning process, defines a portfolio as a record of a student's learning process: How the students learns and progresses in learning, how they think, question, analyze, synthesize, produce, create, and interact with the their friends and teachers intellectually and emphasizes that they are a record of how they interact emotionally and socially. Simon and Forgette Giroux (2000) and Karakaya (2015) define a portfolio as a systematic accumulation of a student's development in an area, recommended by teachers or peers. In addition, Birgin (2002) defines portfolio evaluation as the collection

of skills in one or more areas obtained through regular accumulation and the evaluation of evidence according to predetermined criteria. As a result, a portfolio is a purposeful collection of studies that show the student's development in the learning process, student efforts and academic success. By using portfolio, the teacher's aim monitors the student's development process; allows the student to monitor his/her own development process; documents student learning outcomes; gives feedback to parents, teachers and students about the student's learning outcomes; provides information about the student for the following years and enables the student to make self-assessment. In this way, the portfolio gives clues about the learning style of the student (Lambdin & Walker, 1994).

Johns (1995) explains the general characteristics of the portfolio as follows:

1. Portfolios are product files and represent students' work over time.
2. Portfolios represent the evaluation objectives of a program.
3. The products selected in the portfolio are chosen for certain purposes.
4. Portfolio products are collected over a period of time; so that students, parents, administrators and teachers can play a role in the evaluation process.
5. Portfolios include students' work, tasks and strategies for approaching them, and reflections on input that encourages assessment.

Advantages of Portfolio

The use of portfolio provides many advantages to the student. The collection and evaluation of the products in the portfolio by the student motivates the student. Engel (1996) stated that portfolios improve students' self-expression skills and contribute to the development of reflective thinking skills. Portfolios, under the guidance of the teacher, include placing the student's chosen work in his/her file; thus portfolios put the student in charge of learning and develop the student's creativity. Portfolio aims to develop the student as a whole, rather than which student knows more as in the classical assessment. The answer is sought for what the student knows (Morgil, Cingör, Erökten, Yavuz, & Özyalçın Oskay, 2004).

Engel (1996) states that many students cannot express themselves fully in schools, and portfolios allow students to express themselves. The portfolio develops students' feelings of curiosity and confidence, and provides opportunities for evaluation and expression. These are sources of energy not only for learning at school, but also for lifelong learning. Portfolios can capture and reveal meaningful aspects of individual life. When teachers examine portfolios with children, they can observe that they are indeed using new tools for teaching and that the portfolios used add a different dimension to teaching. By adding

a different dimension to teaching, portfolios develop students' active, creative, energetic, constructive and meaningful mental processes. Strijbos, Meeus, and Libotton (2007) stated that portfolio assessment is a tool that can be used to increase students' general thinking capacity. According to Grady (1996) and Melograno (1996), the advantages of portfolios are: 1) Providing the student with a wide range of study opportunities on a particular subject, 2) Helping students to set goals and providing self-evaluation, 3) Allowing students to progress according to their differences, 4) Allowing peer assessment 5) Focusing on the student's effort and success and improving students in many ways, 6) Allowing association with learning in the assessment and teaching process, 7) Focusing on real student work, not on predictions provided by a score on a standard test, 8) Presenting an effective learning process.

When the literature is examined, it can be said that portfolios contribute to the development of students' reflective thinking, self-evaluation and critical analysis skills (Berrill & Whalen, 2007; De Jager, 2019; Samaras & Fox, 2013). According to Huang (2006), the portfolio evaluation process contributes to the development of students' reflective skills and encourages communication by increasing cooperation among teachers.

Limitations of the Portfolio

The limitations of the portfolio are as follows (Haladyna, 1997; cited by Kutlu, Doğan, & Karakaya, 2014):

1. **Originality for the Student:** The portfolio should consist of the works prepared by the student. However, the student can get help from different sources or people around him during the portfolio preparation process. Therefore, it is difficult to say that the portfolio is prepared entirely by the student. It can be said that this situation negatively affects the validity and reliability of the teacher while scoring the portfolio.
2. **Honesty:** While the portfolio is being prepared during the teaching process, the student can present the portfolio as if he/she prepared it without doing it. The probability of cheating during the preparation of the portfolio is very high. This negatively affects the development process of the student. In order to prevent this, it is important that teachers provide an environment for students to prepare their portfolios and reward students' honesty.
3. **Efficiency:** Both the portfolio preparation and evaluation process are very time consuming. This negatively affects the scoring of the portfolio.
4. **Archiving Student Work:** Archiving student portfolios is the responsibility of teachers and school administration. It is extremely important that student

portfolios are properly stored.

5. **Lack of objectivity (rater inconsistencies, bias):** It is very difficult to objectively score higher-order thinking skills. Objectivity in scoring can be achieved by using a rubric.
6. **Reliability:** It is important to use a rubric to ensure the reliability of the portfolios prepared. For this reason, the rubric should be prepared in a way that makes detailed scoring.

Portfolio Types

In June 1987, the San Diego Professional Development Consortium project gave birth to the concept of professional development portfolio and the professional development portfolio was accepted as a combination of three types of portfolios (Kan, 2007): These are a presentation portfolio, a work portfolio, and a student portfolio. A presentations portfolio shows an individual's achievements, learnings, strengths, and expertise. A work portfolio has been defined as a collection of assignments, works, and other evidence that fulfills prescribed competencies, standards or outcomes. The student portfolio is expressed as a reflection of the knowledge, experience and emotions that will allow the student to define specific learning outcomes. A professional development portfolio should be based on four characteristics: These are purpose, focus, process and results. At this point, students clarify their goals, define their core values and belief systems, focus on their interests and students make a plan for collaboration, learning and reflection, and also prepare "exhibits that define learning" (Piper, 1999).

According to Smith and Tilemma (2006), the purpose of the portfolio determines the type of portfolio created. There are four basic types of portfolios:

1. Dossier portfolio
2. Training portfolio
3. Reflective portfolio
4. Personal development portfolio

Dossier portfolios are portfolios that showcase the student's best work. Both the teacher and the student decide on the work to be selected in the portfolio. Typically, a training portfolio highlights work that demonstrates the professional knowledge, skills or competences achieved. On the other hand, a reflective portfolio is voluntarily prepared by individuals to prove one's own achievements and help them evaluate their own progress. Another common classification is documentation, process and show case portfolio types

(Prince George's Country Public Schools, 2004; cited by Demirli, 2007: 20).

Documentation portfolios: It is defined as a work or work portfolio. In these portfolios, all the works done by the students with or without purpose and the studies that show their development over time are collected.

Process portfolios: All the work done by the student during the learning process can be found here. In this portfolio, students are included in the learning process and in this process, the student is given the opportunity to reflect the learning experience.

Show case portfolios: Portfolios that showcase the best work done by the student. Both the teacher and the student decide together on the work selected in the portfolio. In addition to all these, Rolheiser, Bower, and Stevahn (2000) mention two types of portfolios and these are best reflect work and growth portfolio. The best work portfolios: In fact, they are also known as presentation and showcase. It generally contains the most important and most noted works. It also covers the process of coming up with these best works. Students explain why they are able to transfer their higher learning reflections to these studies and that these studies are the result of their efforts and achievements. Portfolios reflecting progress are portfolios in which the student evaluates himself/herself in line with the goals and monitors his/her success, and shows the status of personal development over time. Today, with the advancement of technology, computers are used as an effective tool for developing and storing portfolios, as they can both store large amounts of content and effectively support and guide the portfolio process. The electronic version of the portfolios is useful, economical, has storage and transfer features, and also aims to help the use of technology.

Electronic Portfolio (E-portfolio)

Until the 1990s, while paper portfolios were preferred for preserving students' studies and the products obtained as a result of learning (Lorenzo & Ittelson, 2005), with the development of technology, students' works are prepared in electronic format and online. This is cost-effective, easy to share, portable, accessible from anywhere with an internet connection, visible to anyone who is given access to them (in the case of a portfolio that requires a password), almost indelible, and a quick assessment tool for the teacher (Thomas et al., 2001).

With the increase in the use of information and communication technology in the education system, it can be said that the use of the electronic version of the portfolio, which is called e-portfolio, web-based portfolio or digital portfolio instead of portfolio, has become widespread both in teaching and as a complementary assessment tool. E-portfolios can present documents in formats such as pictures, graphics, videos and texts by making use of multimedia, as well as having all the features of traditional paper-

based portfolios. Therefore, it can be said that they have a great advantage in terms of both enriching the activities and providing convenience. The most distinctive difference of e-portfolios from paper portfolios is that they are completely online. In e-portfolios, as in paper portfolios, the presentation is not only in the form of printing, but can offer multiple options to the user. Therefore, e-portfolio developers are free to create a variety of formats, including audio, text, graphics, video and multimedia, rather than being limited to one connector. The large number of software applications available today offer the opportunity to create virtually any type of artifact digitally in portfolio creation. Traditional paper portfolios have always met teacher assessment requirements and have typically been used as a tool to understand and monitor students' progress. However, looking at the practices, teachers usually decide for themselves which works will be placed in the portfolio and which will be passed on to the next teacher. E-portfolios, on the other hand, allow students and teachers to work collaboratively on the skills and requirements of the project (Ada, Tanberkan Suna, Elkonca, & Karakaya, 2016). As a result, the e-portfolio offers various benefits such as what a regular portfolio should look like and what students should do during the learning process. E-portfolios can take different forms, including software-based portfolios, CD-ROM-based portfolios, and Internet-based portfolios. Due to usability and prevalence, internet-based portfolios are preferred more. These are also called web-based portfolios and more recently known as blogs.

Thomas, Lamson, and King (2001) defined e-portfolios as a collection of works and reflective statements in electronic format that show the progress in students' professional and intellectual competences. On the other hand, MacDonald, Liu, Lowell, Tsai, and Lohr (2004) define e-portfolios as multimedia environments that show the reflective thinking of students and works that show document professional growth and student competencies. Barrett (2007) defines an e-portfolio as "a collection of original and diverse evidence drawn from a larger archive that represents what an individual or organization represents and is designed for presentation to one or more audiences for a specific purpose".

E-portfolios give teachers the opportunity to learn about the interests of their students and to monitor their individual development processes. E-portfolios offer teachers and students the opportunity to learn and apply the latest technology used in education (Cassiano, 1999). An e-portfolio is an electronic filing format chosen to demonstrate the progress of student learning over a semester. An e-portfolio file may contain many works such as photography, video, research projects, interviews and reflective writings (Carl & Strydom, 2017).

The e-portfolio system is a web-based software system with digital storage features that can be accessed via the World Wide Web. Traditional e-portfolio systems in education include Google Apps, Mahara Systems, WordPress, Blogger, LiveBinders, Weebly,

PebblePad, and Canvas. The first of the most important technological features of an e-portfolio system is the display of the work done, and the second is the learner's ability to easily change the collected content to achieve different goals. These technological features are indisputably mandatory components of any e-portfolio system, as they help the student document the prepared content and share their personal and professional development.

The advancement of information and communication technologies in recent years has contributed to the increase of using of technology in education. At the same time, e-portfolio, one of the technologies used in education, offered innovative and creative ways to support students' learning. The main purpose of using e-portfolio is to enable students to document their personal development (San Jose, 2017). The e-portfolio is not only a work product file, but also a space and tool that can be used to support individual learning and competences (Barrett, 2007).

Because the e-portfolio is online, it is easy to access. An e-portfolio usually includes a series of web pages that organize and contain the user's work (Kimball, 2003). In the use of e portfolio, first of all, a home page comes to the front of the user. The main page of the e-portfolio contains links to the content. Thanks to these links, the e-portfolio user can easily navigate through the site and examine the works that make up the content of the e-portfolio.

An e-portfolio is not a haphazard collection of works, but a neatly organized collection of works that represent a guided purpose. Works are supported by written narratives that reflect the work within the portfolio and how it relates to its purpose. The structure of the e-portfolio should be developed before starting the selection of works. Heath (2004) states that the e-portfolio is not only a collection of works, but also has the purpose of showing the knowledge and skills of the creator. The purpose of the e-portfolio is to show the creator's improvement in the knowledge and skills over time.

Kahtani (1999) recommends that students create e-portfolios because it is difficult and time consuming to find product files or portfolios kept in different places. On the other hand, Heath (2002) argues that after the portfolio is transferred to electronic environment, it is easier to maintain, edit and update it than paper samples. In addition, in e-portfolios, the work of students can be collected, stored and managed electronically using very little physical space (Ayaz, 2021). E-portfolios are electronic collections that represent an individual's level of knowledge or work status in general terms (Heath, 2005). The works in this collection are work pieces that show the development of a person's skills in a certain time period (Ada, Tanberkan Suna, Elkonca, & Karakaya, 2016). These can be reports, assessments, essays, digital pieces, audio and conceptual tools.

The student's learning objectives in completing the e-portfolio are:

- The student understands that it is important to respect the students they collaborate with when creating performance-based projects.
- The student expresses his/her thoughts on a topic clearly and consistently while using technology during learning process.
- The student comprehends and applies programs such as HyperStudio and Portfolio Evaluation Toolkit to create a portfolio (Cassiano, 1999)

Advantages of E-Portfolio

In general, portfolios lead students to think critically about their own developmental processes and encourage students to take responsibility for their own learning through self-assessment (Harring & Luo, 2016; Krause, 1996; Sata & Karakaya, 2020). Since the portfolios created are in electronic version, they encourage students to learn about electronic resources and emerging technologies (Lorenzo & Ittelson, 2005). With the increase in the use of technology in education, its use in different fields has become widespread. E-portfolios allow students to evaluate their skills with computers and other technology devices. In addition, since designing e-portfolios requires a creative approach, it improves students' creativity (Ayaz, 2021). Another benefit of using eportfolio is that it increases the teacher-student interaction in the learning environment, provides the student with an individual learning experience and provides a natural environment for the individualization of their goals (Stoddart, 2006).

Cohen (2005) stated that the use of e-portfolio in education will provide teachers with the following advantages:

1. Contributing to the observation of a student's development process over time.
2. Providing each student with the necessary information to develop a program in line with their own learning.
3. Enabling students to participate in the creation of portfolios that help them understand their own strengths and weaknesses.
4. Ensuring that a strong communication method is used. (Teachers, parents, children and other family members can play a role in creating and reviewing the portfolio).

The e-portfolio is used not only as a means of assessing students' knowledge and skills, but also as a learning tool. Teachers can effectively assess students' skills and learning progress by using the e-portfolio. Oehlman, Haegar, Clarkston, and Banks (2016) stated that an e-portfolio supports reflective learning, facilitates the transfer of knowledge, and actively engages students who are not active enough in the course. Hawisher and Selfe

(1997) listed the benefits of e-portfolios to students as follows: First, students will attach importance to the product creation process and therefore their learning motivation will increase. Because e-portfolios will enrich students' work by using various multimedia tools and will enable them to share their work more easily. Second, e-portfolios are both more portable and require less physical storage space than paper portfolios. Third, creating an e-portfolio can be seen not only as textual literacy using technological tools, but also as a form of web pages that students can design according to themselves.

E-portfolios are generally committed to the integration of various purposes such as reflective thinking, deep learning, student assessment and grading, career and curriculum vitae planning, program evaluation, academic counseling, curriculum planning, course evaluations, tenure decisions, institutional evaluations, and so on. (Stewart, 2018). Paper-based portfolios, like e-portfolios, although they encourage learning, do not provide as many advantages as e-portfolios. Although different versions of portfolios encourage learning, the use of e-portfolios is more common for some reasons. Common reasons for using e-portfolios include easy portability and remote access. E-portfolios provide a digital platform where data can be stored quickly and accessed quickly (Atasoy, Somyürek, & Karakaya, 2018; Barrett, 2007; Gülen, 2020).

With the e-portfolio, students have the opportunity to store the products they prepared during the teaching process on the web, to evaluate their own work, to share their work with their friends, and to evaluate the work of their friends (Atasoy, Somyürek, & Karakaya, 2018).

Limitations of the E-Portfolio

Although e-portfolio has some advantages over paper portfolios in using or preparing it, it also has some limitations in terms of usage and technique. Some limitations of e-portfolios are grouped under the following titles (Alan, 2014; Montgomery and Wiley, 2008; Sata and Karakaya, 2020; Van Wesel and Prop, 2008):

Requirement of technical equipment: It is necessary to have different technological tools (such as hard disk, scanner, computer, video recorder) in order to transfer the prepared portfolios to electronic media.

Requires technical skills: In order to prepare a portfolio and transfer it to electronic media, it is necessary to have the ability to use some technological tools (such as computer, software) and to have technical equipment to eliminate technical malfunctions in some technological tools (such as voice recorder, video recorder).

Requirement of internet: It is very important to have the internet in the e-portfolio application process. Because the portfolio application process and the interaction in the

application process are provided via the internet.

The difficulty of protecting personal information: The e-portfolio application is a system open to everyone. This makes it difficult to protect information about students. Therefore, private information about the student should be protected so that it is not shared in the portfolio.

High cost requirement: E-portfolio systems are more costly than paper portfolios because they require some technological tools (scanner, computer, video recorder, internet, webcam, etc.).

Proderick (1998) expressed the difficulties in developing e-portfolios as follows:

1. Lack of software, hardware and personnel training,
2. Teachers' lack of technological competence and hardware support.

Conclusion

When the studies on the e-portfolio are examined, it is seen that many studies have been carried out by different researchers at different levels in Turkey and abroad (Goeman, 2007; Huang, Yang & Chang, 2011; Polat-Demir, 2020; Barrot, 2016; Chang, Liang, Chou & Liao, 2018; Gök, Baş & Ayaz, 2020; Gülbahar & Köse, 2006; Ayaz, 2021). It has been observed that a significant part of the studies on e-portfolio have revealed the effect of students on their academic achievement in a learning area. Studies have revealed that the evaluation of the e-portfolio provides more feedback to the students and teachers than the evaluation made with traditional methods and the e-portfolio supports the students in giving the responsibility of learning to the student and keeps the student more active in the process, and increases the communication between the student-parent-teacher. The researches were carried out mostly in the form of experimental studies. Studies have focused on basic skills (reading, writing, speaking), thinking skills and personal characteristics (association, socialization, responsibility) rather than lifelong learning skills, and mostly undergraduate studies have been conducted. It has been observed that studies on thinking skills (critical thinking, creative thinking and reflective thinking) are relatively few in the literature. It was concluded that e-portfolio applications contributed to the development of these skills according to the findings obtained in these studies.

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