

Effectiveness of Educational Electronic Portfolio in Classroom Assessment at College Level

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Abstract

The utilization of educational technology is an emerging trend and phenomenon around the globe, it is also introducing rapidly in the education system. Currently, the formation of the latest opportunities, context, and digital technology bring the important changes in the teaching learning strategies and overall evaluation used in approximately all discipline, which they used digital portfolio. The educational electronic portfolio plays their role in the students learning as well as in their academic assessment. The incorporation of technology is common in the education system but the use of the electronic portfolio for students, assessment is a new phenomenon in academia. Action research was carried out in a public college in Punjab, Pakistan. The sample of the study was 25 students from second year, and five students from PGD program, and all 14 instructors of the college. The educational electronic portfolio was developed by the instructors with the help of the experts and then the introduction and guidance about educational electronic portfolio was given to selected students and all instructors of the college. Both instructors and students created the educational electronic portfolio. The data was collected by students and instructors. Two Likert scale questionnaires with 3-point options were used for data collection. Data was analyzed by SPSS and Descriptive statistics were calculated. Findings show that the majority of the instructors and students were in favour of the educational electronic portfolio and consider it as an effective and innovative tool for learning and assessment as well. Study recommended that instructors need to learn to create such type of educational electronic portfolios for students' assessment purposes. Moreover, this strategy can be applied in the classroom to enhance students' learning.

Keywords: Educational Technology, Educational electronic portfolio, classroom assessment.

1. Introduction

Globally, students and teachers are increasingly focusing on integrating information and communication technology (ICT) into education. The teaching and learning processes function optimally when supported by effective evaluation methods. In academia, educational electronic portfolios play a significant role in this context. A key feature of ICT is digital media technology, facilitated by web-based connectivity (Ali, Nargis, Yasmeen, & Iqbal, 2015). Meaningful student learning is gauged through valid assessment strategies, positioning assessment and evaluation at the core of educational practices (Wuetherick & Dickinson, 2015). This aspect is regarded as a central and vital component of the teaching and learning environment, serving as the heart of higher education (Wibawa & Paidi, 2019).

Today, traditional assessment methods are evolving into modern digital approaches, such as e-portfolios (Yang, Wang, & Lim, 2023). Assessment is integral to educational practices, and technology greatly enhances this process by enabling the evaluation and monitoring of students' academic progress and learning experiences. The advancement of technology and its global demand in academia cannot be overlooked (Wuisan, Imelda, & Wibawa, 2019). The e-Portfolio has become abundant in higher education by the last decade, with educational institutions and faculty giving both financial resources and time to its use (Bryant & Chittum, 2013).

In educational electronic portfolios, students are encouraged to collect, generate, share, collaborate, and reflect on their learning (Kunnari & LaUrikainen, 2017). Instructors provide valuable feedback on these portfolios. Consequently, developing electronic portfolios cultivates a range of competencies among students, including creativity, planning skills, critical thinking, information organization, digital literacy, and reflective thinking (Rubio & Galvan, 2013). Additionally, the process of creating portfolios enhances students' creativity in specific subjects (Wibawa & Wibawa, 2022).

2. Rationale of the Study

The traditional pattern of assessment is being practiced in academia. It creates problems for students and teachers in terms of quality. The students cannot monitor their own learning and progress as well. The teacher cannot give them accurate feedback on students' learning and assessment by the traditional pattern of their assessment methods. Therefore, this study was planned in order to monitor students learning and assessment by -portfolios. Students can monitor their learning and assessment through the development of educational electronic portfolios. Teachers also can give constructive feedback on students learning and assess their progress and performance.

2.1. Research Objectives

To identify the effectiveness of Educational electronic portfolio for learning and assessment in classroom.

2.2. Research Questions

How effective are educational electronic portfolios in classroom assessment.

2.3. Research Hypothesis

Educational Electronic portfolio is an effective tool for teachers to assess students' work and enhance their learning.

2.4. Methodology

This study was an action research. The primary objective was to evaluate the effectiveness of educational electronic portfolios for students' learning and assessment. Additionally, the study aimed to raise awareness of educational electronic portfolios among both students and teachers.

2.5. Sample

The sample was conveniently selected from a college located in Fateh Jang, District Attock. Details of the sample are given in Table 1.

Table 1: Sample of the study

Institutions	Teachers	Students second year (ICS)	Students Post Graduate Diploma (PGD) and Diploma of Information Technology (DIT)	Total Sample Size
Public College	14	25	5	
	14	30		44

The strength of the students is 25 of second year (ICS). Five students added in sample who are taking courses of PGD (Post Graduate Diploma) and DIT (Diploma of Information Technology); therefore, the total sample size was thirty students and 14 college teachers.

2.6. Tool for data collection

Educational Electronic Portfolio was used as an instrument in the study. An electronic portfolio is a collection of students' work, efforts, progress and accomplishments by using a computer. An Educational electronic portfolio was developed on Microsoft Word by the researcher. Microsoft Word is used for documentation and also for the development of the (electronic portfolio) website. The first page of the educational electronic portfolio features an introduction to the student, followed by a collection of assignments and projects completed throughout the Master of Education (M.A.) program.

These works are linked to the first page of the portfolio via hyperlinks. Additionally, the electronic portfolio includes animated images, quotations, and an animated background for a more engaging presentation. And the first page was saved as web on HTML. Two self-made questionnaires validated by experts were utilized to take responses from teachers and students about the effectiveness of educational portfolio for learning and assessment of students. The questionnaire for teachers was three-point Likert-scale and had twenty questions. The questionnaire for students was also three-point Likert scale and had eighteen questions.

2.7. Procedure of data collection

Action research was conducted in a public college at Fateh Jang. The introduction of an educational electronic portfolio was given to all the teachers and students through PowerPoint presentation. For almost three weeks, students of ICS were taught how to create an educational electronic portfolio. Each student developed her own educational electronic portfolio on Microsoft Word and PowerPoint. They included their CVs, assignments, and tasks during their classes in educational electronic portfolio, however, the assessment in the research was summative assessment. Students' Educational electronic portfolio was shown to the teachers and then teachers gave their opinion through questionnaire about the effectiveness of the educational electronic portfolio of the students' learning and assessment. Students who developed their educational electronic portfolio also gave their opinion through questionnaires.

3. Data Analysis

The data was analyzed in two ways. One method was used to analyze the data by the use of SPSS. Descriptive statistics were calculated. Tables were made to show the frequencies, the mean, and percentages of the scores of each students and teacher. In another way, the data was analyzed using cut points.

3.1. Descriptive Statistics

Based on the responses of the participants, Table 2 shows the scores in relation to the effectiveness of educational electronic portfolio for students' assessment and learning. Three-point Likert scale was used in the questionnaire. The minimum score was 1 while the maximum score was 3. The maximum score of the questionnaire could have been 60 for each respondent. As the majority of the respondents obtained scores above 50%, the cut point was set at 75%, which corresponds to a score of 45. The table shows that almost all the teachers found the electronic portfolio a very effective assessment and learning tool for the students.

The results presented in Table 2 indicate a significant shift in teachers' perceptions regarding assessment methods. Notably, 43% of teachers expressed dissatisfaction with traditional assessments, while an equal percentage had no opinion, leaving only 14% satisfied. In contrast, all teachers acknowledged the introduction of modern educational technologies in remote areas. A strong majority (79%) deemed educational electronic portfolios as the most effective assessment tool, although 21% were uncertain about their effectiveness. Furthermore, 93% of teachers agreed that students should create their own portfolios to document their work, and 79% believed that these portfolios enable students to assess their own learning. An impressive 86% of the teachers felt that electronic portfolios could enhance student learning, while all agreed on the importance of encouraging students to compile their best work.

Additionally, 64% supported the idea that parents could access their children's portfolios, and 86% believed these portfolios foster creativity. The consensus was clear: all teachers viewed electronic portfolios as beneficial for helping students articulate their learning, motivating them to excel, and preparing them for future professional endeavors. However, there were mixed opinions regarding the time required to create these portfolios, with only 14% believing it was not time-consuming, while 43% felt it was. Finally, 57% of teachers thought that electronic portfolios encouraged independent learning, and 86% asserted that they are more effective than traditional assessments. Overall, the data suggests a strong endorsement for educational electronic portfolios, highlighting their role in promoting student engagement, creativity, and responsibility for learning.

Table 2: Teacher responses about e-portfolio utilization (n=14)

Items	Yes	To some extent	No
a) Teacher responses of teachers about the satisfaction of students' assessment.	2 14.3%	6 42.2%	6 42.9%
b) The introduction of latest educational technologies in a college.	14 100%	-	-
c) Educational electronic portfolio as an effective assessment tool.	11 76.6%	3 21.4%	-
d) Educational electronic portfolios to be made by students	13 93%	-	1 7%
e) Assessment of students' own work through educational electronic portfolio.	11 79%	3 21%	-
f) Increase students learning through Educational electronic portfolios.	12 86%	2 14%	-
g) Encouragement of teachers to students for making Educational Electronic portfolio.	14 100%	-	-
h) Parents' assessment to their child's work through Educational Electronic portfolio.	10 64%	4 36%	-
i) Increase of creativity among students by making educational electronic portfolios	12 86%	2 14%	

j) Educational electronic portfolios as an effective tool to show students best work.	14 100%	-	-
k) Encouragement of students to think about their learning by educational electronic portfolios	14 100%	-	-
l) Encouragement of students for doing more good and hard work by educational electronic portfolios.	14 100%	-	-
m) Educational electronic portfolios to help students in their future professional life.	14 100%	-	-
n) The problem-solving skills among student' by educational electronic portfolios.	7 50%	7 50%	
o) Making educational electronic portfolios is a time consuming process.	6 43%	6 43%	2 14%
p) Educational electronic portfolios to help students to learn independently.	8 57%	5 36%	1 7%
q) Effectiveness of educational electronic portfolios assessment rather than traditional assessment.	12 86%	1 7%	1 7%
r) Encouragement of educational electronic portfolios to students to take responsibility for their own learning.	12 86%	2 14%	-
s) Educational electronic portfolios help students to share their work with others.	12 86%	2 14%	
t) Making the connection between prior and present experiences of students by educational electronic portfolios.	14 100%	-	-

The results presented in Table 3 highlight students' perceptions of Educational Electronic Portfolios (EEPs). All the students agreed on the need for new educational technologies in remote areas. Approximately 67% expressed satisfaction with how EEPs helped them organize their work, while 33% were less satisfied. Additionally, 67% felt that EEPs provided valuable feedback from teachers, parents, and peers, though 33% had no opinion on this matter. Most students (67%) also viewed EEPs as effective tools for preserving their work and effort, with 33% uncertain about their effectiveness.

Furthermore, 63% of students believed that EEPs created connections between their learning and experiences, while 30% had no opinion and 7% disagreed. Around 60% felt that EEPs enabled them to assess their own work and abilities, though 30% were unsure and 10% disagreed. A smaller percentage, 23%, felt that EEPs guided them toward self-directed learning, with 67% not in strong agreement and 10% dissatisfied. However, 77% indicated that EEPs motivated them to work harder, despite 16% expressing dissatisfaction.

On the topic of time investment, only 33% agreed that creating EEPs was not time-consuming, while 47% had no opinion and 20% felt it required significant time. Approximately 53% believed that EEPs helped them solve academic problems independently, with 37% unsure and 10% disagreeing. The majority (73%) enjoyed the process of creating EEPs, although 20% were dissatisfied and 7% disagreed. Most students (77%) found the creation process manageable, with only 3% considering it difficult. Finally, a notable 90% agreed that EEPs allowed them to share their work and experiences with peers, though 7% were not satisfied and 3% disagreed. Overall, the results suggest that while students generally appreciate the benefits of EEPs, there are varied opinions regarding their time investment and the extent of their impact on self-directed learning.

Table 3: Students' responses on introduction of new educational technology (n=30)

Items	Yes	To some extend	No
i) Responses of students about the introduction of new educational technology in Fateh Jang	30 100%	- -	- -
ii) Electronic Portfolios to give best direction to arrange their work in a sequence	20 67%	10 33%	-

iii) Feedback from their teachers, parents and class fellows by an Educational Electronic Portfolio.	20 67%	10 33%	-
iv) Educational Electronic Portfolio as an effective way to save their work.	20 67%	10 33%	-
v) Educational Electronic Portfolio build connection between their learning and experiences	19 63%	9 30%	2 7%
vi) Assessment of their work and abilities through Educational Electronic Portfolio.	18 63%	9 30%	3 10%
vii) Guidance of Educational Electronic Portfolio to Self-directed learning.	7 23%	21 70%	2 7%
viii) Directions of the Educational Electronic Portfolio to do better and hard work.	23 77%	5 16%	2 7%
ix) Making the Educational Electronic Portfolio is a time-consuming process.	6 20%	14 47%	10 33%
x) Educational Electronic Portfolio to help them to solve their academic and learning problems by themselves.	16 63%	11 37%	3 10%
xi) Taking interest and enjoyment in the process of making Educational Electronic Portfolio.	22 73%	6 20%	2 7%
xii) Difficulty in making Educational Electronic Portfolio.	1 3%	6 20%	23 77%
xiii) Motivation of more hard work through Educational Electronic Portfolio.	21 70%	5 17%	4 13%
xiv) The sharing of their work with their class fellows by an Educational Electronic Portfolio	27 90%	2 7%	1 3%
xv) Improvement of their practical capabilities by Educational Electronic Portfolio.	30 100%	- -	- -

3.2. Discussion

The Educational Electronic Portfolio actively engages students in their learning journey. It provides a clear representation of their growth and development (Baturay & Daloğlu, 2010). By encouraging self-evaluation, it helps students understand their learning processes and focus on their strengths. The portfolio allows students to reflect on their strategies and achievements, ultimately enhancing their performance. Both teachers and students regard the Educational Electronic Portfolio as an effective tool for assessing student learning and preparing them for future endeavors. It enables students to showcase their best work and artifacts to teachers, parents, peers, and classmates. These portfolios compile evidence of student achievements, teacher feedback, and self-reflective analysis.

Teachers advocate for the introduction of the latest educational technologies in remote areas, recognizing the need to develop critical thinking, problem-solving skills, and creativity among students. The Educational Electronic Portfolio encourages students to reflect on their learning and identify areas for improvement (Embaye, 2022). It fosters an interactive process among students, teachers, and parents, tracking progress over time and assessing competencies.

All teachers agree that every student should create their own Educational Electronic Portfolio to maintain a record of their best work. This tool motivates students to track their progress and achievements while promoting the exchange of ideas with others. It encourages active listening, openness to different perspectives, and adaptability in social learning contexts. Furthermore, the portfolio allows students to share their thoughts, feelings, and academic experiences with peers.

In Pakistan, where technology integration in classrooms is essential, the Educational Electronic Portfolio can significantly benefit both students and teachers. It enables teachers to assess student performance and skills, while students can enhance their learning, problem-solving abilities, creativity, and practical skills. As this is a relatively new concept in Pakistan, it is crucial to educate both teachers

and students about the effectiveness of the Educational Electronic Portfolio. This action research aims to explore its impact on student assessment for the first time in the country.

The Educational Electronic Portfolio encourages students to choose appropriate methods to achieve their objectives, analyze their resource usage, and evaluate the effectiveness of their work (Chatham-Carpenter, Seawel, & Raschig, 2010). Most respondents agreed that it creates meaningful connections between prior and current learning experiences. However, many noted that creating an Educational Electronic Portfolio can be time-consuming. Parents can also assess their child's best work and efforts through this tool, providing feedback on strengths and weaknesses, which motivates students to work harder. The majority of students expressed that their parents, teachers, and classmates could offer valuable feedback through the Educational Electronic Portfolio, helping them identify their strengths and weaknesses. They also appreciate the opportunity to self-assess and recognize their own capabilities (Nkalane, 2018).

The portfolio provides feedback throughout the learning process, encouraging students to reflect on their strengths, needs, errors, interests, challenges, and objectives (Light, Sproule, & Lithgow, 2009; Kwong & Churchill, 2023). Most respondents felt that it enhances critical thinking and problem-solving skills. Many students reported that they could independently resolve academic challenges through the use of the Educational Electronic Portfolio. They enjoyed the process of developing their portfolios, finding it manageable and beneficial. Through the Educational Electronic Portfolio, students can share experiences with peers, independently access their knowledge, and improve their practical skills. Both students and teachers view it as an effective tool for enhancing learning and assessment in their academic and professional lives.

An electronic portfolio serves as a digital collection of student data, enhancing learning by providing methods to achieve, organize, and display work on both group and individual levels. Assessments through e-portfolios are convenient and advantageous, as they allow for the storage of various digital artifacts, including videos (Mahasneh, 2020). The implementation of e-portfolios in any subject promotes a student-centered learning approach and supports diverse strategies that facilitate formative evaluation. The Educational Electronic Portfolio can thus be effectively utilized as a tool for both learning and assessment in academia.

4. Conclusion

The Educational Electronic Portfolio is an effective tool for assessing students' work and artifacts. It allows teachers and parents to evaluate a child's efforts and accomplishments, while also enabling students to reflect on their academic performance. Through the Educational Electronic Portfolio, students can identify their strengths and weaknesses, facilitating a deeper understanding of their studies. This platform empowers students to share their work with others, motivating them to produce higher-quality outputs.

Most teachers and students expressed satisfaction with the Educational Electronic Portfolio for both assessment and learning purposes. They believe it fosters independent learning, nurtures creativity, and enhances critical thinking and problem-solving skills. Additionally, it connects past experiences with current learning, guiding students toward self-directed study. However, teacher guidance remains essential for the effective development of the Educational Electronic Portfolio.

Given its potential benefits, it is crucial to integrate the Educational Electronic Portfolio into our education system. This integration will enhance student assessment and learning through technology, ultimately benefiting their professional and future endeavors. The study recommends incorporating educational technology, particularly the Educational Electronic Portfolio into the education system to improve student assessment and learning outcomes.

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