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Teaching Writing Using E-Portfolio: It's Effect on Students' Writing Ability at State University of Malang

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Abstract

Currently, it is crucial for teachers to implement alternative assessment techniques that encourage active student participation, and the e-portfolio is considered a solution that facilitates student-centered learning. Electronic portfolio is a big system that can be employed for educational and employment purposes. This study examined the effects of using an electronic portfolio (e-portfolio) in improving students' writing ability. This research employed a quantitative research method with a quasi-experimental design. This quasi experiment involved 100 students from the State University of Malang (58 women and 42 men) as subjects. The results showed that students in the experimental group outperformed the students in the control group. Task achievement, coherence and cohesion, lexical resource, grammatical range and accuracy, overall score, relevant, valid, authentic, recent, transferable, sufficiency, and at least at higher vocational level were the indicators used in this study. It was found that coherence and cohesion, grammar range and accuracy, and overall score did not differ significantly.

Keywords: *e-portfolio; writing ability; teaching writing*

INTRODUCTION

Nowadays, teachers are demanded to employ alternative assessment techniques that promote students' active participation in the learning process and teachers need to apply student-centered instructional strategies. In regards to these needs, e-portfolio can accommodate the metabolism of information and communication technologies (ICT) in learning, particularly in writing. Student-centered teaching method put the students at the center of the learning process where they are encouraged to perform self-assessment.[1] has established electronic portfolio as a tool that manages lifelong learning and documenting in order to promote both deep and sustainable learning. Portfolio has been a good alternative to modern standardized tests as it provides accurate information about students' abilities in different aspects and it promotes student-centered learning where students are actively engaged into learning.[2]

[1] Jill D. Jenson and Paul Treuer, "Spirituality: What It Is and Why It Matters," *Spirituality: What It Is and Why It Matters*, no. April (2013): 1–256, doi:10.1093/acprof:oso/9780199738748.001.0001.
[2] Meltem Huri Baturay and Ayşegül Daloğlu, "E-Portfolio Assessment in an Online English Language Course," *Computer Assisted Language Learning* 23, no. 5 (2010): 413–28, doi:10.1080/09588221.2010.520671.

Transcripts issued and published by professor date from the mid-1980s (mostly in humanities courses and disciplines with strong written components, such as English and Communication Studies), and student e-portfolios were on spotlight in higher education in the mid-1990s. Students essentially collected their work, selected samples for submission, and reflected on what they learned in print and in today's tech mode.[3] Recent evidences of[4] show that electronic portfolios are more frequently-used along with the advancement of computer technology and the Internet. "Electronic portfolios" may be prominent in campus computing, as more institutions have started to encourage their students to create portfolios to showcase their academic works.

E-portfolio is a significant advancement in e-learning that can be used in any language courses around the world, although EFL students are not yet fully familiar with it.[5] Electronic portfolio can improve teaching, learning and evaluation practices. In addition, e-portfolio also enhance student counseling, professional preparation or student dependencies or graduates, transfer of philosophy, practices and self-efficacy in offices, institutional credentials and other programs. This report defines and classifies electronic portfolios by providing examples of electronic portfolio implementations for higher education level based on the current practice and future potentials. This study also reviewed the implementation of electronic portfolio technology, including various issues and challenges within.[6]

In recent years, the new technologies praised e-portfolio as a viable substitute for standardized testing. The e-portfolio assessment is beneficial because it facilitates self-directed learning and provides feedbacks for both students and teachers. E-portfolio can enable the development of the psychological reality or self-assessment of the students which can enhance students' cognitive maturation.[7] The electronic portfolio is a technique that accurately reflects students' performance and provides data on students' competitiveness in a variety of learning domains.[8] The integration of e-portfolio into current and future eLearning strategies demonstrates significant influences on academic policies that apply across institutions.[9] Portfolios use students' natural propensity to save their work to be later reviewed in order to find strategies on how they can improve their future works.[10]

Numerous studies recognize the benefit of e-portfolio implementation which involves the teachers and administrators to work together. Future research can use a

[3] George Lorenzo and John Ittelson, "An Overview of E-Portfolios (ELI Paper 1:2005)," no. July (2005).
[4] Robert C Reardon, Jill A. Lumsden, and Katie E. Meyer, "Developing an E-Portfolio Program: Providing a Comprehensive Tool for Student Development, Reflection, and Integration," *NASPA Journal* 42, no. 3 (2005): 368–80, doi:10.2202/1949-6605.1513.
[5] Samaneh Karami et al., "The Potential Impact of the Application of Electronic Portfolio on Iranian EFL Learners ' Writing Performance Seeking Their Gender Role," *Cogent Social Sciences* 4, no. 1 (2019): 1–17, doi:10.1080/23311886.2018.1562509.
[6] Lorenzo and Ittelson, "An Overview of E-Portfolios (ELI Paper 1:2005)."
[7] Maryam Sharifi, Hassan Soleimani, and Manoochehr Jafarigohar, "E-Portfolio Evaluation and Vocabulary Learning: Moving from Pedagogy to Andragogy," *British Journal of Educational Technology* 48, no. 6 (2017): 1441–50, doi:10.1111/bjet.12479.
[8] Baturay and Daloğlu, "E-Portfolio Assessment in an Online English Language Course."
[9] Gillian Hallam and Tracy Creagh, "EPortfolio Use by University Students in Australia: A Review of the Australian EPortfolio Project," *Higher Education Research and Development* 29, no. 2 (2010): 179–93, doi:10.1080/07294360903510582.
[10] Baturay and Daloğlu, "E-Portfolio Assessment in an Online English Language Course."

narrative approach to examine how teachers use Facebook in giving writing instructions, identifying the learning obstacles and determining proper strategies to overcome these obstacles.[11] Electronic portfolio demonstrates how learning issues such as retention and achievement can be addressed and improves students' confidence at critical transition points.[12]

Previous studies recognize the importance of self-regulated learning, where e-portfolio facilitates goal settings which eventually brings significant and positive impacts on self-regulated learning.[13] Therefore, the use of the electronic portfolio can ensure that individuals and professional development goals are aligned with the objectives and strategic direction of the parent organization.[14]

This study limitedly examined the use of e-portfolio in improving students' writing ability. The definition of writing ability terms of instructional approaches varies, where no single definition is accepted and agreed upon by all English writing researchers and professionals due to the nature of writing that is multifaceted.[15] Each approach and definition offers different sets of advantages and disadvantages, depending on which aspect of writing that is emphasized. Therefore, it is necessary to conduct studies on each approach and definition.

Writing ability can be developed through pedagogical approaches, by using writing instructions that align with the generally accepted writing instructions while taking into account students' characteristics and the pedagogical objectives in a given context.[16] Having adequate writing ability is required, especially for students majoring English as a second or foreign language.[17] A quasi-experimental design was used to investigate the effects of electronic portfolio on students' writing ability to close the gaps in previous research and to overcome methodological limitations.

An Overview of E-Portfolio

An extensive study conducted by[18] has identified four distinctive characteristics for software developers: Users (i.e. students) should own and manage their e-portfolios; e-portfolios should be used responsibly, with information shared selectively and thoughtfully. With granular pieces of digital information, e-portfolios are intended to foster critical reflection and lifelong learning. e-Portfolio is studied in depth in Marketing Strategy course to increase student engagement in their own learning through

[11] C. R. Rogers, "Toward Becoming a Fully Functioning Person. In A.W. Combs (Ed.), Perceiving Behaving Becoming a New Focus for Education" 0, no. 0 (1962).
[12] Julie Hughes, "E-Portfolio-Based Learning: A Practitioner Perspective," *Enhancing Learning in the Social Sciences* 1, no. 2 (2008): 1–12, doi:10.11120/elss.2008.01020005.
[13] Chi Cheng Chang et al., "Using E-Portfolio for Learning Goal Setting to Facilitate Self-Regulated Learning of High School Students," *Behaviour and Information Technology* 37, no. 12 (2018): 1237–51, doi:10.1080/0144929X.2018.1496275.
[14] Narelle Hampe and Suzanne Lewis, "E-Portfolios Support Continuing Professional Development for Librarians," *Australian Library Journal* 62, no. 1 (2013): 3–14, doi:10.1080/00049670.2013.771766.
[15] Jyi-yeon Yi, "Defining Writing Ability for Classroom Writing Assessment in High Schools" 13, no. 1 (2009): 53–69.
[16] Ibid.
[17] Mahboobeh Saadat and Majid Fayaz Dastgerdi, "Correlates of L2 Writing Ability of Iranian Students Majoring in English," *Procedia - Social and Behavioral Sciences* 98 (2014): 1572–79, doi:10.1016/j.sbspro.2014.03.580.
[18] Jill D. Jenson and Paul Treuer, "Spiritual. What It Is Why It Matters."

reflection on their performance on various tasks and the development of knowledge about the learning process itself.[19] The use of e-portfolios has been an interesting issue to be discussed. Furthermore, recent evidences suggest that e-portfolios can be a platform for students to improve their learning process.

The belief that portfolios improve student achievement through "the integration of theory, action, self-reflection, group learning, and assessment" is a strong basis for their use in higher education.[20] A considerable amount of literature has been published on this topic, where [21] found that students preferred the portfolio method as they received weekly feedbacks on assignments and they were given the opportunity to redesign their portfolio prior to final submission which allows students to make self-improvements.[22] Concluded that the e-portfolio evaluation process benefited students and teachers by encouraging self-directed learning and providing feedback. e-portfolio can make students become more self-sufficient and optimistic about learning. Händel et al mentioned that students could upload files to an online learning management system via an e-portfolio application. Students can also record and reflect on prior learning experiences in their own words (learning diary), plan their learning, set goals, and track their progress toward those goals by checking the to-do list, and interact with other students in a discussion.[23]

Portfolios integrate the theories, practice, reflection, and evaluation into effective learning. Electronic portfolios (e-portfolios) are broader development of this concept that serves as a "content management system" for collecting, considering, exchanging, and presenting learning outcomes using digital technology.[24] While portfolios provide learners with the opportunity to track their own progress and take responsibility for meeting their goals, electronic portfolio allow better and easier management, where students can share it through electronic forums.

Previous Studies on E-Portfolio

Previous research from Baturay & Daloğlu indicated that students who used e-portfolio showed greater satisfaction with the learning process.[25] They found that e-portfolio provides more information about their strengths and weaknesses as it reflects students' academic progress beyond a test score. In this study, t-test was employed to examine the difference in students;' self-regulated learning in the pretest and posttest. In addition, students are encouraged to have better self-regulated learning. Four constructs

[19] Venkatapparao Mummalaneni, "Reflective Essay and E-Portfolio to Promote and Assess Student Learning in a Capstone Marketing Course," *Marketing Education Review* 24, no. 1 (2014): 43–46, doi:10.2753/mer1052-8008240107.
[20] Dale Fitch et al., "The Use of Eportfolios in Evaluating the Curriculum and Student Learning," *Journal of Social Work Education* 44, no. 3 (2008): 37–54, doi:10.5175/JSWE.2008.200700010.
[21] Yasemin Gülbahar and Hasan Tinmaz, "Implementing Project-Based Learning and E-Portfolio Assessment in an Undergraduate Course," *Journal of Research on Technology in Education* 38, no. 3 (2006): 309–27, doi:10.1080/15391523.2006.10782462.
[22] Sharifi, Soleimani, and Jafarigohar, "E-Portfolio Evaluation and Vocabulary Learning: Moving from Pedagogy to Andragogy."
[23] Marion Händel, Bastian Wimmer, and Albert Ziegler, "E-Portfolio Use and Its Effects on Exam Performance–a Field Study," *Studies in Higher Education* 45, no. 2 (2020): 258–70, doi:10.1080/03075079.2018.1510388.
[24] Fitch et al., "The Use of Eportfolios in Evaluating the Curriculum and Student Learning."
[25] Baturay and Daloğlu, "E-Portfolio Assessment in an Online English Language Course."

of student self-regulated learning include learning motivation, self-observation, self-assessment, and self-assessment, while their sub-constructions include subject value, self-assessment and adaptive self-reaction outperformed students' pretest results by a significant margin.[26]

Another study mentioning that e-portfolio had several benefits [27] stated that students' conversational and writing skills can be improved through the use of e-Portfolios. The effects on students' speaking abilities are generally positive, and this can be seen in their language use as a result (grammar, pronunciation, and vocabulary) as well as their psychological condition, specifically their feelings of anxiety and insecurity when speaking. The e-portfolio assessment was found beneficial because it facilitated self-directed learning and provided both students and teachers with feedback.[28]

As explained by Welsh,[29] both self-assessment and formative peer assessment were effective in fostering self-regulation in students and that e-portfolio system accommodates the assessment process. Händel et al, stated that compared students who did not use e-portfolio, students who use e-portfolio obtained higher exam scores.[30] The findings of Hung suggest that e-portfolio assessment has a number of beneficial effects on learning, including the formation of a community of practice, the facilitation of peer learning, the enhancement of content knowledge learning, the promotion of professional development, and the development of critical thinking.[31]

These following research questions were addressed as follows.

(1) Does the writing ability of students who used e-portfolio platform significantly improve after the test?

(2) Is there any significant differences in students' writing ability taught using and without using e-portfolio?

METHOD

Design of the Study

In this quantitative study, quasi-experiment design was used to determine any causes and effect relationship between independent and dependent variables[32]. In this quasi experiment, participants were assigned into groups.

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[26] Chang et al., "Using E-Portfolio for Learning Goal Setting to Facilitate Self-Regulated Learning of High School Students."

[27] Saban Cepik and Ahmet Erdost Yastibas, "The Use of E-Portfolio to Improve English Speaking Skill of Turkish EFL Learners," *Anthropologist* 16, no. 1–2 (2013): 307–17, doi:10.1080/09720073.2013.11891358.

[28] Sharifi, Soleimani, and Jafarigohar, "E-Portfolio Evaluation and Vocabulary Learning: Moving from Pedagogy to Andragogy."

[29] Mary Welsh, "Student Perceptions of Using the PebblePad E-Portfolio System to Support Self- and Peer-Based Formative Assessment," *Technology, Pedagogy and Education* 21, no. 1 (2012): 57–83, doi:10.1080/1475939X.2012.659884.

[30] Händel, Wimmer, and Ziegler, "E-Portfolio Use and Its Effects on Exam Performance–a Field Study."

[31] Shao Ting Alan Hung, "A Washback Study on E-Portfolio Assessment in an English as a Foreign Language Teacher Preparation Program," *Computer Assisted Language Learning* 25, no. 1 (February 2012): 21–36, doi:10.1080/09588221.2010.551756.

[32] John W. Creswell., *Educational Research : Planning, Conducting, and Evaluating Quantitative and Qualitative Research (4th Ed.)* (Boston, MA: Pearson, 2012).

Participants

There were 100 participants of this study (58 women and 42 men) from the State University of Malang who attended English courses. Participants were first-year accounting undergraduate students enrolled in two separate English classes, whose ages ranged between 18 to 19 years. 50 students were assigned in the treatment group, while the other 50 students were assigned in the control group.

Students in both control and treatment groups had at least three years of experience with using mobile phones. They also had a similar history to L1; they were bilingual English speakers who grew up speaking Indonesian language as their L1. None of them had history of visit to other countries. Participants had been first asked for their consent in advance. Each group member did not make any interaction with the ones of the other group and both of the groups were taught by one teacher.

Before the treatment, students' writing abilities were first evaluated. According to the findings, a statistically significant difference was found in the writing abilities between the control and treatment groups.

Pre-Test and Post-Test Scores

During the first week, each participant completed a written pretest and posttest. The results of these two tests revealed whether or not the students' writing ability improved. Pre- and post-tests were administered to both groups with equal writing conditions and materials. During the tests, students were not permitted to look up to any reference materials (such as a dictionary). Students were allowed to choose their own topic related to social issue. They used a different social theme in the posttest to prevent them from using the same content from the pretest.

There were nine points assigned to each of the four dimensions of writing ability: task achievement, coherence and cohesion, lexical resource, grammatical range and accuracy, and overall score. The writing must be relevant, valid and authentic, and it should be recent, transferable, sufficient, and show higher education level. The tests were evaluated by two experienced English teachers who were familiar with the material. The raters had at least eight years of experience teaching English and were experienced in evaluating term papers.

Procedure

The teacher, who also served as the treatment group's administrator, created a WhatsApp group to facilitate online portfolio submission. A set of e-portfolio guideline was also provided to support the process. The guideline explained the format, and objectives of the portfolio as well as the detailed the process for developing and publishing the portfolio, evaluation criteria and ethical standards that students were expected to adhere to while completing the project.

The research was carried out in two accounting classes for several months. Students in the treatment and the control groups learned the same topics and were given the same amount of time to complete their tasks. A single didactic approach consisting

of eight phases of writing: planning, modeling, collaborative writing, individual writing, reviewing, editing, and publication was used [33].
The modeling phase required the students to analyze the rhetorical characteristics, the social purpose, the target audience, and the language used in the sample texts during the reading period. Brainstorming, preliminary research, and drafting were the parts of the planning phase. Collaborative and individual writing activities were also conducted. During the collaborative writing phase, students worked in pairs to complete the essay based on the framework that they had created in the planning stage. After that, students re-do the activities from the preparation, modeling, and planning stages with a different theme.

The review phase took place after the drafts were completed. This phase was divided into three sections: self-assessment, peer feedback, and teacher feedback. Students were required to review their work based on the given feedback. Both treatment and control groups were given equal feedback and review opportunities. Based on the feedback, students revised their work as their final drafts. Their final drafts were then revised for grammatical and typographical accuracy. All of those changes were recorded and uploaded as portfolio. The control group used the traditional portfolio, whereas the treatment group used the WhatsApp group's electronic portfolio.
For the final mid-term week, a session was scheduled to prepare for the portfolios. Students' portfolios were discussed and prepared. The instructor demonstrated how to create a record (a conventional portfolio for the control group and an electronic portfolio for the treatment group). The students in the control group submitted their written portfolios to be compiled into a transparent book.

Data Analysis

In order to provide quantitative responses to the research questions, the pre- and post-test scores were analyzed into SPSS Version 21. To examine students' writing ability, the mean score (M) and standard deviations (SD) were calculated. Data normality was also tested in this study. The paired t-test was used to determine the difference between the pre- and post-test scores of the two groups in the study. The gaps in values obtained between the treatment and control groups were measured on an independent t-test.

RESULTS AND DISCUSSION

Test of the normality

The data obtained from the pre-test and post-test were measured in separated ways.
Table 1. Data Normality

No	Variable	Group	Paired	Kolmogorov-Smirnov[a]			Decision
				Statistic	df	p-value	
1	Task Achievement	Treatment	Pre-test	.337	50	.000	
			post-test	.151	50	.006	
		Control	Pre-test	.288	50	.000	
			post-test	.156	50	.004	

[33] Jessie Barrot, "A SOCIOCOGNITIVE-TRANSFORMATIVE APPROACH TO TEACHING WRITING" 4, no. 2 (2015).

2	coherence and cohesion	Treatment	Pre-test	0.285	50	.000	
			post-test	0.1	50	.006	
		Control	Pre-test	.277	50	0.0000	
			post-test	.118	50	.07900	Normal
3	lexical resource	Treatment	Pre-test	.282	50	0.0000	
			post-test	.053	50	.20000	Normal
		Control	Pre-test	0.265	50	.000	
			post-test	0.142	50	.013	
4	grammar range and accuracy	Treatment	Pre-test	.232	50	.000	
			post-test	.075	50	.200*	Normal
		Control	Pre-test	.245	50	.000	
			post-test	.156	50	.004	
5	overall score	Treatment	Pre-test	.264	50	0	
			post-test	.106	50	.20000	Normal
		Control	Pre-test	.260	50	.000	
			post-test	.092	50	.200*	Normal
6	Relevant	Treatment	Pre-test	.121	50	.066	Normal
			post-test	.217	50	.000	
		Control	Pre-test	.109	50	.191	Normal
			post-test	.187	50	.000	
7	Valid	Treatment	Pre-test	.115	50	.095	Normal
			post-test	.180	50	.000	
		Control	Pre-test	.126	50	.045	
			post-test	.117	50	.083	Normal
8	Authentic	Treatment	Pre-test	.093	50	.200*	Normal
			post-test	.173	50	.001	
		Control	Pre-test	.110	50	0.1840	Normal
			post-test	.141	50	.01500	Normal
9	Recent	Treatment	Pre-test	.090	50	.200*	Normal
			post-test	.110	50	.180	Normal
		Control	Pre-test	.098	50	.200*	Normal
			post-test	.108	50	.200*	Normal
10	Transferable	Treatment	Pre-test	.157	50	.004	
			post-test	.101	50	.200*	Normal
		Control	Pre-test	.098	50	.028	
			post-test	.108	50	.200*	Normal
11	Sufficient	Treatment	Pre-test	0.131	50	.032	
			post-test	0.233	50	.000	
		Control	Pre-test	.139	50	.018	
			post-test	.118	50	.077	Normal
12	At least at	Treatment	Pre-test	.119	50	.073	Normal

higher vocational level		post-test	.142	50	.014	
	Control	Pre-test	0.103	50	.200*	Normal
		post-test	0.096	50	.200*	Normal

The normality of the data was measured using Kolmogorov test to see the *p-value.* Statistic test was performed, where if $P - value > \alpha\,(0.05)$, H0 was accepted, indicating that the data were normally distributed. Data normality test is the first step that was followed by *t test* if the data were normally distributed. If the data were not normally distributed, the theory of the central limit which would be applied.

"Definition: The central limit theorem states that when more than 30 samples are taken, the sampling distribution curve will center on the population parameter values and will exhibit all of the properties of a normal distribution"

Therefore, if the data are normally distributed, t-test can be conducted.

Descriptive Statistic (analyzing the characteristics of data)

The descriptive statistic resulted in the mean, standard deviation, max value and minimum value for each variable in the pre-test and post-test.

Table 2. Descriptive Statistic Test

No	Variable	Group	Descriptive	Pre-Test	Post-test
1	Task Achievement	Treatment	Mean	3.44	3.0558
			SD	.67491	.43408
			Min	2.00	2.50
			Max	4.00	4.00
		Control	Mean	3.3500	1.6114
			SD	0.68698	.52579
			Min	2	1.00
			Max	4.00	2.48
2	coherence and cohesion	Treatment	Mean	3.3900	3.3080
			SD	.60009	.46679
			Min	2.00	2.52
			Max	4.00	4.00
		Control	Mean	3.3300	1.6118
			SD	0.682208	.43766
			Min	2.00	1.00
			Max	4.00	2.48
3	lexical resource	Treatment	Mean	3.34	3.3820
			SD	.65807	.38148
			Min	2.00	2.50
			Max	4.00	4.00
		Control	Mean	3.2900	1.8170
			SD	.70051	.42507
			Min	2.00	1.12

			Max	4.00	2.48
4	grammar range and accuracy	Treatment	Mean	3.1700	3.4202
			SD	.79289	.39569
			Min	1.00	2.51
			Max	4.00	3.99
		Control	Mean	3.03	1.8252
			SD	.82320	.42537
			Min	1.00	1.12
			Max	4.00	2.48
5	overall score	Treatment	Mean	3.2700	3.4172
			SD	.72288	.42662
			Min	2.00	2.53
			Max	4.00	4.00
		Control	Mean	3.2600	1.9086
			SD	.74396	.35129
			Min	2.00	1.21
			Max	4.00	2.49
6	Relevant	Treatment	Mean	4.2060	6.7504
			SD	2.13832	1.07495
			Min	1.00	4.51
			Max	8.00	8.00
		Control	Mean	4.944	3.2986
			SD	1.58180	1.00524
			Min	1.00	1.00
			Max	8.00	4.48
7	Valid	Treatment	Mean	3.6040	5.1886
			SD	1.22940	.63073
			Min	1.00	3.50
			Max	5.80	6.00
		Control	Mean	3.6580	2.6822
			SD	1.58528	.57378
			Min	1.00	1.11
			Max	8.00	3.48
8	Authentic	Treatment	Mean	4.1040	6.8934
			SD	1.66144	1.00776
			Min	1.00	4.53
			Max	7.90	7.99
		Control	Mean	4.9220	3.0236
			SD	1.61792	.96547
			Min	2.30	1.00
			Max	8.00	4.48

9	Recent	Treatment	Mean	2.5880	3.3358
			SD	1.10521	.44425
			Min	1.00	2.51
			Max	6.00	4.00
		Control	Mean	2.6540	1.9268
			SD	1.09474	.37419
			Min	1.00	1.00
			Max	6.00	2.48
10	Transferable	Treatment	Mean	.5160	.7110
			SD	.24020	.14307
			Min	.10	.50
			Max	1.00	1.00
		Control	Mean	.5900	0.2176
			SD	.21876	.14879
			Min	.20	0.00
			Max	1.00	.49
11	Sufficient	Treatment	Mean	3.0220	5.8928
			SD	1.44594	.94494
			Min	1.00	4.00
			Max	6.40	7.00
		Control	Mean	4.4280	2.782
			SD	1.66526	.87401
			Max	1.00	1.20
			Min	8.00	3.98
12	At least at higher vocational level	Treatment	Mean	3.5160	4.4470
			SD	1.26545	.72919
			Min	1.00	3.52
			Max	6.00	6.00
		Control	Mean	3.3780	2.4072
			SD	1.34972	.87401
			Min	1.00	1.20
			Max	5.80	3.98

The *Task Achievement of the treatment group* obtained a mean score of 3.55 before the treatment, which increased to 3.0558 after treatment. The value of standard deviation in variable *Task Achievement* treatment group before the post-test was 0.67491 and decreased to 0.43408 afterward. Standard deviation value under the average showed that *Task Achievement* in treatment group had low variety. The maximum value in the pre-test data was 4 and the minimum was 2.

For the control group, the *Task Achievement* variable showed a mean score of 3.35 before the treatment which then turned to 1.611 after the treatment. The standard deviation value in variable *Task Achievement* control group before the post-test was

0.68698 and 0.52579 after the post-test. The value was included in the upper average, indicating that the *Task Achievement* in control group were not varied. The maximum value in the *pre-test* was 4 and the minimum was 2.5.

Paired Sample statistics

Table 3 presents the results of the descriptive statistic test.

Table 3. Paired Sample Statistics

No	Nama Variable	Group	Paired	N	Mean	SD
1	Task Achievement	Treatment	Pre-test	50	3.44000	.67491
			post-test	50	3.0558	.43408
		Control	Pre-test	50	3.3500	.68698
			post-test	50	1.6114	.52579
2	Coherence and cohesion	Treatment	Pre-test	50	3.3900	.60009
			post-test	50	3.3080	.46679
		Control	Pre-test	50	3.3300	.68221
			post-test	50	1.6118	.43766
3	lexical resource	Treatment	Pre-test	50	3.3400	.65807
			post-test	50	3.3820	.38148
		Control	Pre-test	50	3.29	.70051
			post-test	50	1.817	.42507
4	grammar range and accuracy	Treatment	Pre-test	50	3.1700	0.7929
			post-test	50	3.4202	0.3957
		Control	Pre-test	50	3.0300	0.82320
			post-test	50	1.8252	.42537
5	Overall score	Treatment	Pre-test	50	3.2700	.72288
			post-test	50	3.4172	.42662
		Control	Pre-test	50	3.2600	.74396
			post-test	50	1.9086	.3513
6	Relevant	Treatment	Pre-test	50	4.2060	2.13832
			post-test	50	6.7504	1.07495
		Control	Pre-test	50	4.944	1.5818
			post-test	50	3.2986	1.0052
7	Valid	Treatment	Pre-test	50	3.6040	1.22940
			post-test	50	5.1886	.63073
		Control	Pre-test	50	3.6580	1.585
			post-test	50	2.6822	.574
8	Authentic	Treatment	Pre-test	50	4.104	1.66144
			post-test	50	6.8934	1.00776
		Control	Pre-test	50	4.922	1.61792
			post-test	50	3.0236	.96547

9	Recent	Treatment	Pre-test	50	2.588	1.10521
			post-test	50	3.3358	.44425
		Control	Pre-test	50	2.6540	1.095
			post-test	50	1.9268	0.37419
10	Transferable	Treatment	Pre-test	50	.5160	.24020
			post-test	50	.7110	.14307
		Control	Pre-test	50	0.59	0.21876
			post-test	50	0.2176	.149
11	Sufficient	Treatment	Pre-test	50	3.022	1.44594
			post-test	50	5.8928	.945
		Control	Pre-test	50	4.4280	1.66526
			post-test	50	2.7820	.87401
12	At least at higher vocational level	Treatment	Pre-test	50	3.5160	1.26545
			post-test	50	4.4470	.72919
		Control	Pre-test	50	3.378	1.34972
			post-test	50	2.4072	.64740

For the result of interpretation, it looked at the difference of mean score both pre-test and post-test from each group of the variable were if the value of *pretest* < *Post-test* or *pre-test* > *Post-test* then there was difference mean score from the variable at the pr-test and post-test.

Interpretation of *Task Achievement*:

Mean of *pretest* (3.44000) > *post-test* (3.0558) at *task achievement variable Treatment group* so it can take conclusion that there was difference both pre-test and post-test. Furthermore, to prove there was the difference is truly true (significant) or not. Then, it needs test of *paired sample t test* which serve at **table 4.**

Paired Sample T test

Test of Statistic

If P-value < 0.05, H_0 is rejected and H_1 is accepted

Table 4. Paired Sample T-test

No	Nama Variable	Group	N	Mean	SD	DF	t-value	p-value	Result
1	Task Achievement	Treatment	50	.38420	.76008	49	3.574244	.001	H_1
		Control	50	1.7386	0.10941	49	15.890	.000	H_1
2	coherence and cohesion	Treatment	50	.08200	0.7142	49	.812	0.420799	H_0
		Control	50	1.71820	.11432	49	15.029	.000	H_1
3	lexical resource	Treatment	50	-0.042	0.70042	49	-.424	.673	H_0
		Control	50	1.473	0.1188	49	12.4	.000	H_1
4	grammar range and accuracy	Treatment	50	-.25020	.88237	49	-2.00503	.051	H_0
		Control	50	1.20480	.11715	49	10.284	.000	H_1

5	overall score	Treatment	50	-0.1472	.76315	49	-1.36389	.179	H_0
		Control	50	1.3514	.11077	49	12.2	.000	H_1
6	Relevant	Treatment	50	-2.5444	2.61968	49	-6.86788	.000	H_1
		Control	50	1.6454	0.2417	49	6.808	.000	H_1
7	Valid	Treatment	50	-1.58460	1.5159	49	-7.392	.000	H_1
		Control	50	.97580	0.2472	49	3.948	.000	H_1
8	Authentic	Treatment	50	-2.7894	2.18774	49	-9.016	.000	H_1
		Control	50	1.89840	.26350	49	7.205	.000	H_1
9	Recent	Treatment	50	-.74780	1.1971	49	-4.417	.000	H_1
		Control	50	0.7272	.15139	49	4.803	.000	H_1
10	Transferable	Treatment	50	-0.195	.26123	49	-5.278	.000	H_1
		Control	50	.37240	.0375	49	9.918	.000	H_1
11	Sufficient	Treatment	50	-2.8708	1.70999	49	-11.871	.000	H_1
		Control	50	1.64600	.26916	49	6.115	.000	H_1
12	At least at higher vocational level	Treatment	50	-0.931	1.47282	49	-4.47	.000	H_1
		Control	50	0.9708	1.2723	49	5.395	.000	H_1

Interpretation of Task Achievement variable according to **table 4.**
If P-Value <0.05, H_0 is rejected and H_1 is accepted, implying that there is a significant difference in the mean scores in both pre-test and post-test of Task Achievement in treatment group and control group. Table 4 shows 3 H_0 were accepted, indicating no difference in the mean scores in the result pre-test and post-test that included:

- Treatment group *coherence and cohesion*
- Treatment group *grammar range and accuracy*
- Treatment group *overall score*

Paired Samples Correlation

Table 5. Paired Correlation

No	Nama Variable	Group	N	Correlation	Sig.
1	Task Achievement	Treatment	50	.11300	.435
		Control	50	.207	0.148
2	coherence and cohesion	Treatment	50	.121	.402
		Control	50	0.006	0.968
3	lexical resource	Treatment	50	.175	.223
		Control	50	-0.057331	0.692
4	grammar range and accuracy	Treatment	50	.011	.942
		Control	50	0.246	0.085
5	overall score	Treatment	50	.198	.168
		Control	50	0.121	0.401441
6	Relevant	Treatment	50	-.247	.084
		Control	50	0.186	0.196

7	Valid	Treatment	50	-.251	.079
		Control	50	-0.116633	0.42
8	Authentic	Treatment	50	-.302	.033
		Control	50	0.025	0.863
9	Recent	Treatment	50	-.014	.921
		Control	50	0.235	0.1
10	Transferable	Treatment	50	.144	.317
		Control	50	-0.008	0.958
11	Sufficient	Treatment	50	.022	.881
		Control	50	-0.029	.840
12	At least at higher vocational level	Treatment	50	-.020	.893
		Control	50	.356	0.011

Table 5 presents the results of the paired correlation or the correlation between the results of the pre-test and the post-test. The correlation value of task achievement was 0.113 with the significant value 0.148> probability 0.05. Hence, no correlation was found between the variables based on the results of the pretest and posttest. .

- In the treatment group, the correlation coefficient was -0.302, indicating that the correlation reversal between pre-test and post-test was 0.302 that is considered large compared to the correlation value of another variable $(0.033) < \alpha\,(0.05)$ level of significant. Therefore, there was a correlation between pre-test and post-test variables.
- The control group obtained a coefficient correlation of 0.358, indicating that the linear correlation between pre-test and post-test was quite large big compared to the correlation at another variable with $(0.011) < \alpha\,(0.05)$. Therefore, it can be concluded that there was a correlation between pre-test and post-test variables.

Discussions

The scores from the pretest and posttest were put into SPSS Version 21 for quantitative analysis that aimed to answer the research questions. The mean score (M) and the standard deviation (SD) of students' writing ability were descriptively analyzed. Both groups were subjected to a paired t-test to see the gap between their pretest and posttest scores. The independent sample t-test allowed the analysis of the gaps in the scores obtained by the treatment and control groups.

Table 1 shows the data of normality test obtained by both control group and treatment group. The data were normally distributed as shown by the $-value > \alpha\,(0.05)$. Therefore, H0 is accepted (normal). Furthermore, the t- test can be conducted. Table 4 presents result of t-test statistic through SPSS. The twelve indicators were task achievement, coherence and cohesion, lexical resource, grammar range and accuracy, overall score, relevant, valid, authentic, recent, transferable, sufficient, and at least at higher vocational level. Most of indicators indicated the effects of students' behavior in E-portfolio assessment that showed $P - value > \alpha\,(0.05)$. In addition, there are 3 indicators that showed insignificant effect, namely the text coherence and

cohesion in treatment group, grammar range and accuracy in treatment group, and overall score in treatment group.

It can be concluded that the e-portfolio significantly affected students' writing ability. In line with Hallam & Creagh, e-portfolios as a product and as a process have received greater interests from higher education sector through surveys, focus groups, and the Australian e-portfolio Symposium, which piqued academics' interest in engaging with and deepening their understanding of the contribution of e-portfolios to learning within and outside university setting. In order to gain a better understanding of the aspects of e-portfolios, including the diverse dimensions of knowledge construction, student attitudes, new teacher roles, employer expectations, eLearning-supported pedagogies, emerging technologies, and interoperability, further studies should be conducted to examine the impacts and potential of e-portfolios in higher education.[34]

E-portfolio can be used to improve the education sector as a new way of learning. It was stated by Baturay & Daloğlu that students who used e-portfolio gained benefits from the process. In addition, they believed that keeping an e-portfolio provided them with more information about their strengths and weaknesses than simply receiving a test score because they can get holistic picture of their academic progress in English course. Many students expressed their gratitude for the opportunity to use e-portfolio as they found it helpful in teaching them how to read and write, express themselves and communicate with their instructor in English which used to be difficult before due to the fear of making mistakes.[35]

Chang et al, found that students' overall self-regulated learning, as well as the majority of constructs became more significant after completing online goal setting tasks through an e-portfolio. Goal setting has improved students' self-regulated learning, while using e-portfolio for goal setting has been statistically significant and beneficial in promoting self-regulated learning. An e-portfolio can be used effectively in public speaking because it can assist students in improving their communication skills through practices. Student tend to show positive attitude toward e-portfolio as they find it effective in improving their grammar, pronunciation, and vocabulary mastery, as well as their self-confidence, motivation, and anxiety.[36] Cepik & Yastibas found students' speaking abilities improved as a result of the e-portfolio based on the results of the data triangulation. Some experts also mention that e-portfolio is effective in developing greater sense of self-awareness about their learning as students are given the opportunity to self-assess their own learning.[37]

To summarize, the development and implementation e-portfolios depend on a number of critical factors. Teachers require well-articulated justifications and guidelines for developing e-portfolios that should be integrated to the curriculum and learning objectives. In this study, the planning process is critical to the success of e-portfolio evaluation. Teachers who are interested in adopting e-portfolio need to conduct a

[34] Hallam and Creagh, "EPortfolio Use by University Students in Australia: A Review of the Australian EPortfolio Project."
[35] Baturay and Daloğlu, "E-Portfolio Assessment in an Online English Language Course."
[36] Chang et al., "Using E-Portfolio for Learning Goal Setting to Facilitate Self-Regulated Learning of High School Students."
[37] Cepik and Yastibas, "The Use of E-Portfolio to Improve English Speaking Skill of Turkish EFL Learners."

critical and reflective assessment of how the e-portfolios can be optimized and need to design an instrument that fit the educational needs of the learners.

Based on the results of the statistical analysis, variables such as Task Achievement, Overall Score, Relevant, Valid, Authentic, Recent, Transferable, Sufficient, and At Least at Higher Vocational Level indicate a significant difference in average scores between the group of students taught using e-portfolio and the group taught without e-portfolio, both in the pre-test and post-test of Task Achievement. However, variables such as Coherence and Cohesion, Lexical Resource, and Grammar Range and Accuracy show that there is no significant difference in the writing abilities of students taught using e-portfolio compared to those taught without e-portfolio.

In conclusion, the use of e-portfolio in learning has a positive and significant impact, especially on specific aspects such as task achievement, overall score, relevance, validity, authenticity, recentness, transferability, and sufficiency at the higher vocational level. However, there is no significant difference in aspects such as coherence and cohesion, lexical resource, and grammar range and accuracy in students' writing abilities.

CONCLUSION

The pre- and post-test results indicated that both the experimental and control groups made significant improvement in learning. The post-test scores of both groups were significantly higher than their pre-test scores. Students who used e-portfolio in experimental group obtained higher scores than the control group, indicating the significant effect of e-portfolio on students' writing ability. However, some indicators were not found to significantly affect the improvement, including coherence and cohesion, grammar range and accuracy, and overall score which might have occurred because these indicators were not used frequently by the students. As presented in Table 4, P-Value of <0.05 rejects the H_0 and accepts the H_1. This study found a significant difference in the mean scores of both pre-test and post-test of indicators above in treatment group and control group, each of which accepted the H_1.

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