

ENHANCING E-LEARNING EFFECTIVITY THROUGH THE DISCUSSION METHOD COMBINED WITH E-PORTFOLIO ASSIGNMENTS FOR VOCATIONAL EDUCATION MASTER STUDENTS DURING A PANDEMIC

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Abstract


Discussion is one of the effective methods to make the e-learning condition to be student-centered. However, the use of the discussion method only focuses on specific issues, so that it could not explore broader knowledge and obtain feedback from many sources. The study aims to get the impact of using the discussion method combined with e-portfolio assignments on e-learning during the Covid-19 pandemic in students' perceptions perspective. This research has been carried out with a simple procedure using a survey approach. The research subjects are students of the Vocational Education Master Degree who participated in the Vocational Learning Theory and Strategy course. The research instrument is a closed questionnaire to explore student perceptions, including 8-aspects, using statements with options on a 4-degree Likert scale. The average perception level for each aspect is the total score divide by the total maximum score of the research subjects. Perception is declared good if the ratio is above 80%. The results showed that e-portfolio assignments combined with the discussion method in e-learning gave positive student perceptions. Students feel that an e-portfolio is a learning tool that can increase learning effectiveness, provide useful feedback, help carry out self-assessments, and increase interaction between teacher and student. The results also show that the students gave a positive perception to the e-portfolio as a tool that is easy to use, useful, systematic, motivating, and effectively to improve learning outcomes. In general, this result shows that e-portfolio tools can increase the effectiveness of e-learning.


Keywords: *enhancing e-learning, e-portfolio, vocational education*

How to cite: Muchlas, M. (2020). Enhancing e-learning effectivity through the discussion method combined with e-portfolio assignments for vocational education master students during a pandemic. *Jurnal Pendidikan Vokasi*, 10(3), 238-248. doi:<https://doi.org/10.21831/jpv.v10i3.35793>



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INTRODUCTION

The coronavirus's current spread has reached pandemic levels and crossed territorial boundaries on an extensive scale. This situation has a direct impact on all aspects of human life, including education. Through his reportage, Rajab (2020) reports that in March 2020, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has declared that the world of education has felt the pandemic's impact. This condition has caused nearly 300 million students worldwide to be disturbed in their school activities and threatened their future educational rights.

The world of education is currently adapting so that school management and learning activities can continue. Before, many countries have used online learning activities implemented in a blended scenario with face to face. During a pandemic, education authorities in almost every country have established policies to implement fully online learning.

Online learning is one of the e-learning types. The definition of e-learning is very dynamic; it changes from time to time following the development of technology that supports it. Basak et al. (2018, pp. 194-195) concluded that the definition of e-learning is related to the terms mobile and digital learning. The study stated that e-learning is learning supported by digital electronic tools and media, and mobile learning is e-learning using mobile devices and wireless transmission. Meanwhile, digital learning is a type of learning facilitated by technology or instructional practices that make effective use of technology in all fields and domains of learning. There are some differences between them, mobile learning is the subset of e-learning, and digital learning is the combination of e-learning and mobile learning.

Waldrop (2013), Mornal et al. (2014), Knox (2014), and DeBoer et al. (2014) in Cope and Kalantzis (2017, p. 3) said that there are two categories of e-learning environment: new and traditional locus of learning that is being changed by technologies influence. Striking new locus forms are the rise of fully online learning and virtual school, the phenomenon of MOOCs, and open education. Traditional learning locus is also changing, including blended and ubiquitous, extending the range of classical classroom interactions beyond the physical classroom and class time.

In the constellation of education type, the experts have been placed e-learning as part of distance learning. However, other experts view both as the same. As stated by Traxler (2018, p. 2), online learning, digital learning, e-learning, and virtual learning are synonymous and interchangeable and are merely the preferred delivery mechanism for most distance learning. By referring to those views, e-learning is very appropriate to support learning during a pandemic. Implementing the education authorities' policies is mostly aimed to ensure a safe distance between teachers and students in the learning processes. Thus, the learning approach chosen must provide support for remote content delivery, so e-learning is the right choice.

Actually, as a learning tool, e-learning has many advantages. Gon and Rawekar (2017, p. 24) explained that e-learning can give learning outcomes that are not significantly different from learning outcomes using the face-to-face learning method. Meanwhile, other reports show that e-learning is an excellent tool for providing students flexible time, enabling them to study and do other work simultaneously, promising high productivity, and increasing student effectiveness in learning (Mobo & Sabado, 2019, p. 104). Moreover, if it is carried out by students using a learning style in line with the character of the subjects, e-learning will impact increasing high learning achievement (Surjono, 2015, p. 121). However, the use of e-learning without considering students' problems will make this learning ineffective. Some issues in the use of e-learning include: students feel contemplated, isolated, and lack of interaction or relationships, therefore, needed strong motivation and time management skills to reduce these effects (Arkorful & Abaidoo, 2015, p. 34).

Embedding the discussion method in an e-learning process can reduce or even eliminate these problems. Many studies have shown that beside can reduce students' loneliness in learning, the discussion method provides high effectiveness in an e-learning process. Through the discussion method, e-learning can improve students' critical thinking, involve students actively in the learning process, improve class learning achievement, provide problem-solving activity, accommodate individual needs, and increase student motivation (Laal & Ghodsi, 2012, pp. 486-487). Using the discussion method in e-learning activities will no longer cause students to be alone but feel they have a study partner in the knowledge acquisition processes.

Although the discussion method, especially the collaborative small-group method used to support e-learning, has advantages, students only focus on specific problems. Therefore, doing activities for gaining broader knowledge cannot be carried out through this method. On the other hand, in Vocational Learning Theory and Strategy course at the Vocational Education Master Degree, students need to receive a lot of knowledge and feedback from various sources to build comprehensive knowledge. If the method used is an only online discussion, it becomes insufficient to achieve the learning objectives.

Recent research on the online discussion method shows that this method has weaknesses due to the emergence of factors that play a role in individual learning outcomes through group discussions. The study from Stenlund et al. (2017, p. 145) shows that even though 98 respondents have given the written feedback on the group discussions were carried out, it still does not provide a significant effect on increasing knowledge, so this method becomes ineffective. The research recommends that teachers avoid using excessively group discussion as a learning method. There are other exciting study findings that students do not need more than the learning methods. On the contrary, they need something else, namely, the results of learning reviews that are more real from teachers or peers.

This study has previously described that the students need to obtain knowledge and feedback from many sources and review learning from a teacher and other friends. Based on these facts, beside using the discussion method, e-learning needs to be equipped with additional tools to accommodate these needs. E-learning also needs to be equipped with tools for enabling high-order thinking assessments such as applying, comparing, analyzing, synthesizing, evaluating, interpreting, and reflecting. An E-portfolio is one of the means appropriate to support these needs.

The word e-portfolio consists of the letter e, which means electronic, and the word portfolio. There has been much understanding about portfolios since schools first used this learning tool in 1980. Technology developments have changed the portfolio form, from physical files to electronic files, so the term has also changed to e-portfolio. Citing the Cyprus Pedagogical Institute (2015), Poole et al. (2018, p. 3) stated that the e-portfolio concept originated from its predecessor, the traditional paper-based portfolio. Furthermore, they said that both have the same educational goals as storage, display, and assessment media. One of the differences between the two is data management; the traditional manages manual data while the e-portfolio organizes digital data. More specifically, e-portfolios are digital representations of students' work and accomplishments, along with their reflections on learning. The e-portfolio can enhance student learning through the process of collecting, selecting, reflecting, and sharing (Buyarski et al., 2017, p. 8)

The first consideration that must be decided when implementing an e-portfolio is the technology that will be involved. E-portfolio technology provides a collaborative workspace and online repository for learning artifacts, allowing students to create websites showcasing and reflecting on artifacts for a particular purpose (Benander et al., 2017: 99). Based on this definition, the teacher can implement an e-portfolio tool using the web to make students more accessible. The other researcher has also given an e-portfolio definition with applying the web as the basis for development. Eynon and Gambino (2017, p. 1) define student e-portfolios as an attractive element of a web-based digital learning ecosystem that provides facilities for collecting learning artifacts such as scientific articles (papers), multimedia projects, sounds and images, and related reflections focused on the learning process and the growth of student knowledge. The development of a web-based e-portfolio allows one's learning process to be seen by other students in the group, teachers, and even by audiences, depending on the publication's arrangement.

The metamorphosis of the portfolio into an e-portfolio has implications for the increasing number of new functions facilitated by this tool. The students have more convenience in compiling content and, at the same time, being able to present exciting portfolios for themselves and others. In general, by citing Barret and Garret (2009), Macias (2012, p. 502) said that e-portfolios would facilitate content management and collaborative work, allow students to keep notes electronically, and link ideas from multiple sources.

As previously described, the definition of e-portfolio is very diverse. It also has many classifications, and experts have classified these learning tools in various forms. Baumgartner (2009) as quoted by Slepcevic-Zach and Stock (2018, p. 293), divides the types of e-portfolios into reflection

portfolios, development portfolios, and presentation portfolios. Meanwhile, Greenberg (2004) and Barnett (2007) quoted by Mohammed et al. (2015, pp. 329-330), both identified the following three types of portfolios: learning portfolios, presentation portfolios, and evaluation portfolios. This study uses a learning e-portfolio, in which students can collect the ideas as students' reflections on each lesson followed.

There is currently much software that can provide e-learning management functions so that teachers can do their implementation quickly and easily. Software that provides this function is called a Learning Management System (LMS). Some of the LMS software widely known today are Blackboard, WebCT, FirstClass, and Moodle. Generally, LMS has features such as delivering lesson content, online class transaction arrangements, tracking and reporting student progress, assessing learning outcomes, reporting on achievement and completing assignments, collaborative learning arrangements through discussion forums, and setting student documents.

The use of LMS is mostly oriented towards asynchronous online learning with content in various forms, from the text, images to videos that can be accessed by students. Also, this LMS provides feature activities for discussion. This study uses the LMS application from Moodle, which provides a comprehensive content management function. In addition to content in the form of text, images, and videos, the learning used in this study is complemented by two main activities, namely the Discussion Forum and the task of compiling an e-portfolio using the Wiki module (mini blog) available in the Moodle LMS.

Many experts and researchers before have studied the role of e-portfolios as a learning tool that can increase learning effectiveness and be well accepted by students. Macias (2012, pp. 505-506) reports that embedding an e-portfolio approach in a lesson that contains collaborative discussion activities makes students who follow the project-based learning method: (1) agree that e-portfolio as a learning tool that useful, practical, systematic, motivate, and assist the self-assessment process; (2) appreciate the usefulness of the feedback provided by the e-portfolio; (3) agree that e-portfolios can provide mechanisms for building fundamental interactions and are easy to manage, navigate and learn. In general, this research has shown that e-portfolios, combined with collaborative discussion methods, will provide positive perceptions to increase student motivation.

Another survey shows that because students feel that its use can improve learning outcomes and motivate them, they also decide to use e-portfolios continuously, and even outside their majors, especially as a tool for (1) collecting artifacts of knowledge (papers, videos, pictures, voice) and projects in the real world; (2) assist in self-assessment; (3) receive feedback and comments from teachers and other students; and (4) tools to pursue a career (Thibodeaux et al., 2017, p. 7). This view has reinforced that students very accept the use of e-portfolios. The students desire to use it not only as a course requirement but also to support their progress.

A study from other researcher shows that it is more interesting because it turns out that the use of a portfolio can: (1) be a medium for students to demonstrate their higher-order thinking skills in a digital space; (2) offers an excellent opportunity to reflect on their undergraduate career; and (3) become a tool for institutions to assess the knowledge and skills students have acquired throughout the curriculum (Morreale et al., 2017, p. 22).

Beside being used for elementary and middle school students, the portfolio also provides effective learning outcomes for higher education students. Research by Scholz et al. (2017, p. 149) shows that e-portfolios can help support college students in integrative and experiential learning. For the learning process using e-portfolios to be effective, this study provides recommendations teachers have to ensure that students' e-portfolio assignments will be relevant to the desired learning outcomes. Teachers have to monitor the writing of the e-portfolios by students periodically; for example, every time they finish a lecture session. Teachers did it for matching the content written in the assignment with the lecturer's material. This control brings a dilemma because, on the one side, the teacher must always make adjustments so that the portfolio written by students is relevant to the course material. Still, on the other hand, the teacher needs to provide sufficient freedom to express their ideas in an open-ended manner.

E-portfolios are also useful in raising students' self-awareness (reflection) of the achievements. The results of research conducted by Slepcevic-Zach and Stock (2018, p. 299) show that by using e-portfolios, the majority of students who are research subjects have found previously un-

known competencies themselves. The research also found that students become more aware of their competence, better understand themselves, describe themselves better, and feel more capable than they think. This study also shows they become engaged in deeper self-reflection and better formulate competencies and better utilize them. Based on its character, which can generate thinking or reflect, an e-portfolio is very appropriate for a learning tool combined with the online discussion method. In this case, the key to the discussion method's success is the emergence of students' ability to reflect on their learning achievements.

Another study related to the advantages of e-portfolios found that this learning tool can facilitate knowledge sharing and creative thinking activities, and teachers can integrate it with every subject (Chang et al., 2018, p. 39). Through this study, the researcher also found that e-portfolio could help students create new ideas. E-portfolios can facilitate knowledge creation, provide support for reflection activities, self-assessment, peer observation and imitation, peer assessment, and peer feedback.

Based on the description of the various advantages of e-portfolios before, this study can argue this learning tool is very appropriate for use in e-learning learning. In this way, students will gain knowledge from various sources and feedback (reviews) from multiple groups, such as from their peers or teachers. This study investigates responses in student perceptions of using e-portfolios in e-learning, combined with online discussion methods. The methods and classroom settings in this study differ from previous research. This study uses master program students as a research subject for Vocational Education Learning Theory and Strategies lesson. This study also uses the Wiki or Mini Blog features in the Moodle LMS that have never been used on previous studies reviewed.

RESEARCH METHOD

This study is simple to research in the form of a survey of respondents. The research subjects were students of the Vocational Education masters degree at Ahmad Dahlan University as the Vocational Education Learning Theory and Strategy course participants. They are students for the 2018/2019 and 2019/2020 academic years who had participated in the e-learning learning with the group discussion method equipped with an e-portfolio of 53 people. The research sample used the last batch of students as many as fourteen people.

The research instrument is in the form of a closed questionnaire to explore students' perceptions, using statements that have options on a 4-degree Likert scale, namely: 1: strongly disagree; 2: disagree; 3: agree; 4: strongly agree. This study explored eight factors of perception include; six were adopted and developed from the research of Macias (2012) and two others from Chang et al. (2018) and Scholz et al. (2017), as shown in Table 1.

Table 1. The Factor of Perception to E-portfolio

Factor	Source
Capacity	Macias (2012)
Feedback	Macias (2012)
Self-assessment	Macias (2012)
Student-Teacher Interaction	Macias (2012)
Student-Platform Interaction	Macias (2012)
Learning Processes	Macias (2012)
Generating New Idea	Chang et al. (2018)
Learning Integration	Scholz et al. (2017)

Each factor has five statement items as an indicator so that the complete statements in the questionnaire are 40 pieces. The instrument testing in this study was only conducted with a content validity approach. Based on Table 1, all instrument items have been derived from factors that support the concept of perceptions of e-portfolios so that researcher has confidence that all instrument items are valid. This study does not test the reliability of the instruments used. Questionnaires were given to subjects after the teacher carry out the learning process.

In this study, the researcher has designed e-learning using the Moodle application. Beside installing the downloaded facilities, the teacher, as a researcher, also provide a Forum Application to facilitate group discussion activities and a Wiki application (Mini Blog) to support e-portfolio writing activities. The teacher has carried out the e-learning process in 14 virtual meeting sessions.

Data analysis of the student perceptions of the e-portfolio was carried out using the ratio formula. The average perception level for each factor is the ratio between the total score to the total maximum score of the research subjects. Perception is declared good if the ratio is above 80%.

RESULTS AND DISCUSSION

By scoring the data obtained, the results can be presented as in Table 2. Based on Table 2, this study's results indicate that students view the e-portfolio as having an adequate capacity as a learning tool. However, one capacity indicator is perceived to be less practical than others, as presented in Figure 1.

Table 2. Score of Perception to E-portfolio

Factor	Score	Percentage
Capacity	3.43	85.7%
Feedback	3.67	91.8%
Self-assessment	3.29	82.1%
Student-Teacher Interaction	3.26	81.4%
Student-Platform Interaction	3.37	84.3%
Learning Processes	3.23	80.7%
Generating New Idea	3.10	77.5%
Learning Integration	3.16	78.9%

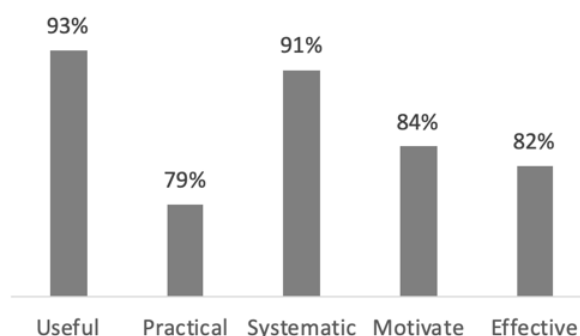


Figure 1. Perception of E-portfolio Capacity Indicators

With only 79% perception of practicality indicators, the results of this research show that e-portfolios are considered less practical as a learning tool. This result can happen because students first find it difficult to operate the Wiki application as an e-portfolio support on the Moodle platform. Students begin to adjust after several lecture sessions to give the impression that it is less practical. However, research data shows that e-portfolios are useful in improving learning, systematic, motivating, and effectively improving learning outcomes. The students' awareness of the usefulness of e-portfolios makes them enthusiastic about using this tool for other workshops in the future, as in Ciesielkiewicz (2019, p. 660).

This study also found that the feedback facility on the e-portfolio has been able to help students improve their material descriptions, improve the communication process with lecturers and other friends, and help improve learning progress. Combining this e-portfolio learning tool with the Forum feature has enriched students' materials with the discussion results. These results indicate an inline with the findings in Macias (2012, p. 5) research.

Students consider e-portfolios a useful tool for improving learning outcomes in the self-assessment factor. However, two indicators have not had a good perception, as shown in Figure 2.

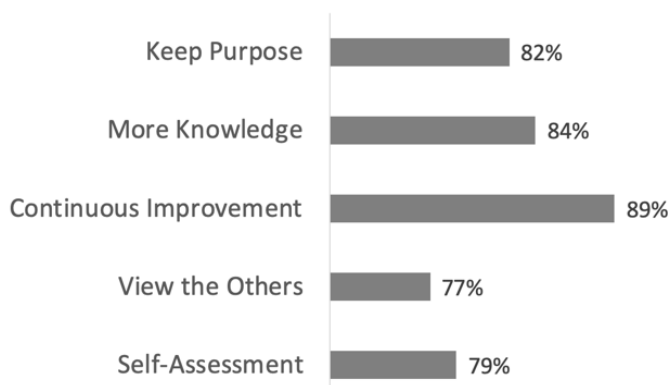


Figure 2. Perception of E-portfolio Self-Assessment Indicators

The facts in Figure 2 show that students could not fully utilize the e-portfolio as a self-evaluation tool. It is assumed that in the learning process, students perceive that the e-portfolio is just as a requirement for attending lectures only. In this case, there is not an awareness of the importance of e-portfolios as part of learning tools that can be used to improve learning.

Actually, the e-portfolio is used by students to share information by seeing each other. However, with a perception score of only 77% on the View the Others indicator, it has shown that e-portfolios have not functioned as a media for sharing information. Perhaps this situation arises because the View facility provided by the Wiki application is not user friendly, so students are reluctant to see other friends' writings.

Students also consider e-portfolios a learning tool that can increase interaction between students and lecturers, increase online discussions and collaborations, and create dynamic lecture situations. E-portfolio also can involve lecturers and students and assist in obtaining study guidance from lecturers and friends.

The data analysis results also found that students feel easy and comfortable to use e-portfolio learning tools embedded in e-learning to compile learning outcomes. Also, they did not take long to adjust the features provided. In general, the survey results show that e-portfolio learning tools are perceived positively by students in the interaction of student-platform factor. Other research of Morreale et al. (2017, p. 17) shows the same results, of the 14 students who responded to the survey, mostly showing an increase in their use of digital media platforms (average 3.36/4.0) and an increase in the likelihood of using their technical skills in other digital media projects in the future (average 3.64/4.0).

This study also found that in the learning process factor, students generally gave a good perception of the e-portfolio tool as a tool that could increase learning effectiveness, even though two indicators were perceived as unfavorable, as shown in Figure 3.

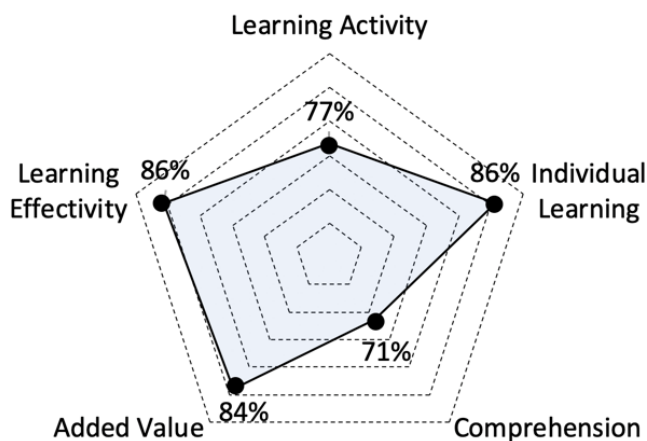


Figure 3. Perception of E-portfolio Learning Process Indicators

The aim of using e-portfolio is to increase student learning activities. Still, the fact shows that with only 77%, students feel that this tool does not encourage activity, especially in exploring material from various sources. Perhaps, this condition, due to students' lack of awareness of the e-portfolio function, can easily collect knowledge artifacts (papers, videos, pictures, sounds). Even though if students can use e-portfolios as a tool to gather knowledge from various sources, these activities will increase their learning capacity (Thibodeaux et al., 2017, p. 7). This condition ultimately affects students' perceptions of indicators of comprehensive learning outcomes. Students feel that the e-portfolio has not been able to gain extensive knowledge, which is shown by the percentage of perceptions of only 71%.

This research can also obtain the information that students gave a positive perception of e-portfolios in generating new ideas. However, there are three indicators in this factor that are perceived as unfavorable by students.

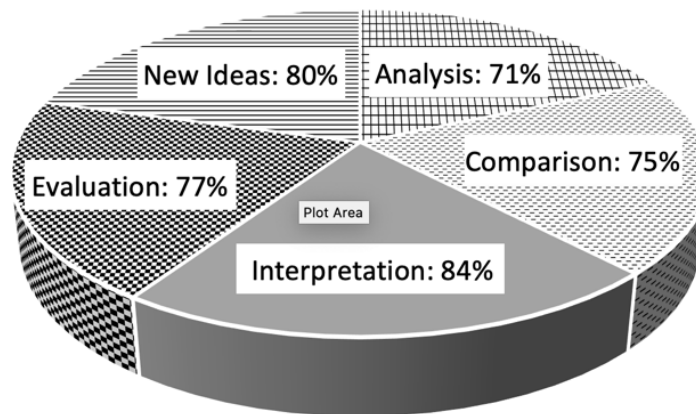


Figure 4. Perception of E-portfolio New Ideas Indicators

Referring to Figure 4, students feel they cannot use e-portfolios as a tool for conducting analysis, comparison, and evaluation. Perhaps, this condition is due to students not having sufficient opportunities to practice high-order thinking skills. Students should obtain skills like this through discussion activities. However, based on the observation of the e-learning web page, the discussion is just a response to meet the requirements for attending lectures, not intensive analysis, comparison including evaluation activities. Besides, most e-portfolio content descriptions are knowledge kind, so it cannot provide practice to increase high-order thinking skills. On the other hand, students perceive that e-portfolios are good to interpret the concepts learned and develop new ideas.

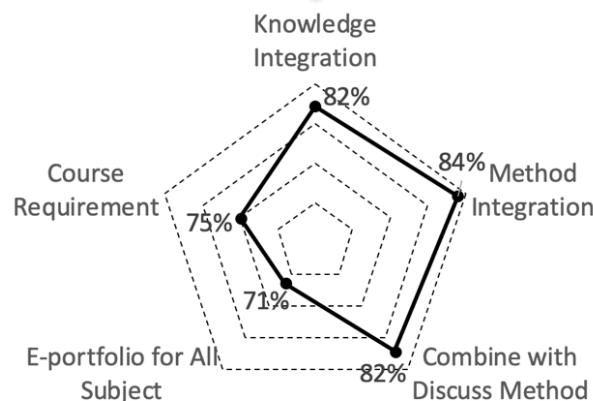


Figure 5. Perception of E-portfolio Learning Integration Indicators

In the factor of Integration of Learning, this study found that students gave a positive perception of the ability of e-portfolios as a tool that can combine knowledge from various sources. They also consider that effective e-learning is not sufficient if supported by discussion method only, so

combining the discussion method with e-portfolio assignments increases learning effectiveness. However, this study also found that two indicators did not get a good perception, as in Figure 5.

By only getting a score of 71%, this study shows that students are still unwilling to use e-portfolio learning tools for all the subjects they follow. This condition happens because students consider that e-portfolios are just a requirement for attending lectures only, not yet perceived as a useful tool to improve learning outcomes.

According to Table 2, this study's results are relatively similar to Macias research outcomes. For all aspects except Student-Teacher Interaction, this study gives a score on that aspect of 82%, far exceeding the previous research score of only 63% (Macias, 2012, p. 506). This result is rational because, in previous studies, e-portfolio assignments were given in a Project-based Learning scenario, where teacher involvement was very little. In this study, the e-portfolio task was embedded in an online discussion method that involved many lecturers interacting with students, so that this aspect score was high. This study also found that e-portfolio assignments are suitable for both undergraduate and postgraduate students, such as previous and this study results.

Compared to previous research, for Generating New Ideas, this study gave a score of 77.5%, which is almost the same as the score produced by Chang et al. (2018, p. 36) of 77.4%. The fundamental difference between this study and previous research is the analysis used. Previous studies have tried to find the correlation between Generating New Ideas and the attitude of sharing knowledge factors. In contrast, this study tries to describe the perception level only of Generating New Idea as one of the e-portfolio response factors.

For the Learning Integration factor, this study obtained an average score of 78.9%. The results are sufficient to view that students have a good perception of the e-portfolio as the bridge for connecting outside knowledge with the course material. However, when viewed from the factors, there is a low perception. As explained earlier, one of the interpretations of Figure 1 is that students perceive that the e-portfolio assignment only fulfills the course requirements. This accident is also happening to students abroad, such as in Scholz et al. (2017, pp. 143-144). That research compares the learning outcomes of students who perceive e-portfolio activities as part of the learning assessments and other groups with opposing views. Meanwhile, this study is limited to exploring the e-portfolio indicator's perception as a medium for integration learning.

By referring to Table 2, the self-assessment factor obtained a score of 82.1%, show that e-portfolios provide a perfect perception in helping self-assessments. The other studies indicate the same results; e-portfolios are very helpful as a self-reflection media (Morreale et al., 2017, p. 19; Slepcevic-Zach & Stock (2018, p. 291). However, a research by Buyarski et al. (2017, p. 54) has shown different results. They have found that the self-assessment factor only obtained a score of 40.5%. This result is presumably because the scoring rubric refers to ideal educational goals and critical thinking that new students cannot fully understand.

Overall, this research has shown that e-portfolio assignments embedded in the online discussion method provide a good perception, especially for vocational teacher students. E-portfolios can be used effectively in teacher training (Totter & Wyss, 2019, p. 69), can support systems related to teacher certification (Fuglik, 2013, p. 15), and can be a systematic tool to assess critical points of competence teacher students (Korhonen et al., 2019, p. 57).

CONCLUSION

This research has revealed that e-portfolio assignments combined with discussion methods in e-learning provide positive student perceptions. Students see that e-portfolio is a learning tool that can increase learning effectiveness, provide useful feedback, help make self-assessments, increase lecturer, and student interaction. The results also show that students consider the e-portfolio a tool that is easy to use, useful, systematic, motivating, and sufficient to improve learning outcomes. This study gives teachers recommendations for enhancing the e-portfolio based on the Wiki application to increase its practicality, be interesting to see, and be more helpful in self-assessment. Another suggestion is to improve methods combined with e-portfolios in providing training in high order thinking skills. Efforts to enhance e-portfolio performance for growing student awareness in the use of these tools as learning media also need to be pursued.

ACKNOWLEDGMENTS

We would like to express our deepest gratitude to Universitas Ahmad Dahlan for providing funding for this research. We also give the highest appreciation to students of the vocational education master program who have been willing to accept various learning treatments for this research's success.

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