



E-portfolio as physics learning assessment

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(Received: 09 January 2021; Accepted: 13 August 2021; Published: 30 August 2021)

ABSTRACT

One of the technologies available to support the assessment process is the e-portfolio. Much research has been done for e-portfolio assessment, and the result can easily find the result in journals. Even though systematic study about e-portfolio as physics learning assessment still rarely done. This research aims to identify the role of e-portfolio as a physics learning assessment in school. A literature study is carried out using four procedures based on PRISMA that are (1) identification, (2) screening, (3) eligibility, and (4) included. Article search has been done through the DOAJ, ERIC, IOP Science, Science Direct, and Springer Link. Based on analysis results, the use of e-portfolio encourages the creation of self-regulation learning. Furthermore, self-regulation learning can help develop a metacognitive skill that students much need for learning physics. Even so, based on 220 articles identified, research about e-portfolio as physics learning assessment has not been found. Therefore, further research is needed to develop and implement an e-portfolio as a physics learning assessment.

Keywords: assessment, e-portfolio, physics

DOI: [10.30870/gravity.v7i2.10228](https://doi.org/10.30870/gravity.v7i2.10228)

INTRODUCTION

One of the essential things in learning is assessment. The kind of assessment that is suitable for physics learning becomes an interesting topic. Furthermore, assessment affects the quality of learning. In other words, the quality of learning depends on how students are assessed and the assessment instrument used.

In physics learning, the active participation of students is very much needed for the knowledge-building process. During that knowledge-building process, metacognitive skills are needed. Metacognitive skills can not be owned instantly by students but need to be

trained and developed during learning proses.

Assessment is not only used to assess student learning outcomes. It can also use to train and develop metacognitive skills. An *E-portfolio* is an authentic assessment that can be used to train and develop students' metacognitive skills. Even though systematic study about e-portfolio as physics learning assessment still rarely done. Based on that, a literature study is needed to identify the role of e-portfolio as a physics learning assessment.

RESEARCH METHODS

In this research, we have done a study of literature to identify how the role of e-

portfolio as a physics learning assessment. The study of literature has been done by using four procedures of PRISMA (Preferred Items for Systematic Reviews and Meta-Analysis) consisting of: (1) identification, (2) screening, (3) eligibility, dan (4) included (Wiyanto et al., 2019). The research procedure chart can be seen in Figure 1.

At the identification stage, an article search is carried out by writing the keyword 'e-portfolio' at websites DOAJ, ERIC, IOP Science, Science Direct, and Springer Link for publication period 2001 to 2020. At the screening and eligibility stage, the article that has been identified by abstract title, keywords, and related topics are downloaded. The full article the analyzed to check compatibility between article topics and research purpose. All appropriate or following the research objectives are then analyzed to obtain a synthesis or conclusion at the included stage.

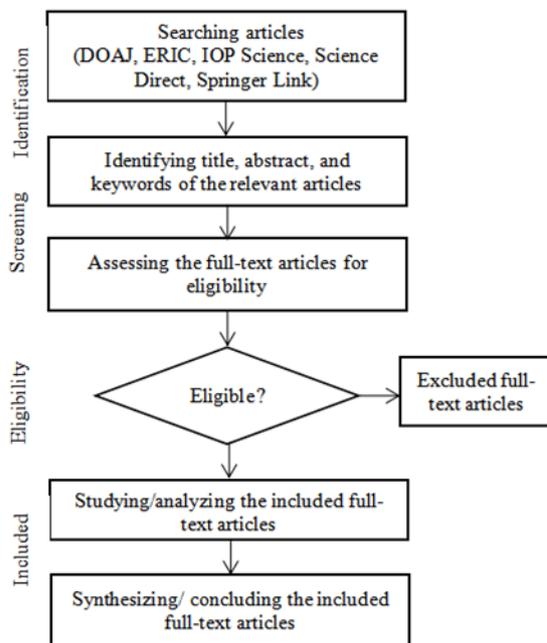


Figure 1. Research procedures

RESULT AND DISCUSSION

Article search is done through websites DOAJ, ERIC, IOP Science, Science Direct, and Springer Link for publication period 2001 to 2020 by write down e-portfolio keywords. Furthermore, article search is done by setting a limit, and only English articles are used. At the

identification stage, the total articles search are 220 articles that contain the e-portfolio keyword. At screening and eligibility, articles identified by title, abstract, keywords, relevant topics, and topic suitability analysis are a total of 11 articles worth further analysis to get synesthesia or conclusion. Article distribution based on article search source and procedures research can be seen in Table 1.

Table 1. Article distribution based on article search source and procedures research

Step	Number of articles					Total
	Science-Direct	ERIC	Springer Link	IOP Science	DOAJ	
Identification	13	133	11	1	61	220
Screening	1	8	0	0	2	11
Eligibility (included)	1	8	0	0	2	11

Based on table 1, for the ERIC website, deliver article identified are 133 articles by eight articles suitable with research purpose. While IOP Science delivers at least one article identifies with only 1 article without a relevant article with research purpose.

At the included stage, all relevant articles are analyzed to get a synthesis or conclusion. Based on the result of 11 articles analysis obtained, using an e-portfolio in learning encourages self-regulation learning. Furthermore, self-regulation learning can help develop a metacognitive skill that is needed for students in learning physics.

Assessment or evaluation is one of the aspects that cannot be replaced in a learning activity. Several studies have proven that assessment affects the quality of learning. In other words, the quality of learning depends on how students are judged and what kind of assessment instrument is used. Furthermore, a good assessment is an assessment that focuses on knowledge and student's thinking skills

(Nsiah & Oti-Boadi, 2015; Moria et al., 2018).

One of the technologies available to support the assessment process is the e-portfolio. E-portfolio is identified as a product that made by students in the form of a collection of digital artifacts (file, multimedia, blog, and hyperlink) that demonstrating and communicating knowledge, skills, and capacity of student in certain learning period and allows various parties to observe and evaluate the progress of student learning outcomes from time to time (Gencel, 2017; Firmansyah et al., 2019; Wijayanti & Basyar, 2016; Hickey et al., 2017). By using an e-portfolio, self-regulation-based learning is created because students using technology for planning, organizing, and facilitating their learning (Romero et al., 2019; Ivanova, 2017; Yang et al., 2015; Tur et al., 2019; Nguyen & Ikeda, 2015; Cheng & Chau, 2013; Farahian & Avarzamani, 2018; Ciesielkiewicz & Coca, 2013; Samardzija & Balaban, 2014; Totter & Wyss, 2019). Furthermore, an e-portfolio based on a website creating self-regulation learning becomes more effective and efficient to improve students' understanding of concepts (Permana et al., 2015; Budiman, 2016). Cera et al. (2013) revealed that self-regulation learning is closely related to metacognitive skill use, planning, monitoring, and evaluating. Metacognitive skills can help students do an activity such as learning strategy selection, time allocation, energy, planning, inspection, settings, and evaluation of learning outcomes needed by students to build knowledge (Barak et al., 2016).

Physics is a lesson that requires metacognitive skills to actively participate in developing knowledge by themselves rather than being a passive receiver during the learning process (Bogdanovic et al., 2015; Aina & Kola, 2017; Nurajizah et al., 2018). The result of Nainabasti's (2016) research shows that students' active participation during learning activity becomes an important thing to develop an understanding of students' concepts. By having metacognitive skills, students can resolve the problem by applying the strategy that they have learned in a similar context as it is known that physics is full of examples finishing phys-

ics problems in general. In the end, students will face new problems in real life. Still, metacognitive skills are ignored by teachers (Wilson & Conyers, 2016; Djudin, 2017; Mas'ud et al., 2018; Alifiani & Walida, 2020).

An E-portfolio is suitable as a physics learning assessment. This is because the implementation of e-portfolio assessment can develop metacognitive skills, which students need to learning physics as it is known that lessons in a new paradigm must be able to help students to have skills that can make it easier for students to find and build knowledge systematically and sustainably (Becerra-Labra et al., 2012). See the potential benefits of using an e-portfolio, much research has been done, but none of it is specifics in physics. Therefore, further research is needed to develop and implement an e-portfolio as a physics learning assessment.

CONCLUSION

Based on the literature study, the use of e-portfolio encourages the creation of self-regulation learning. Furthermore, self-regulation learning can help develop metacognitive learning, which students need for learning physics. Even though, based on 220 identified articles, there is still no research about using e-portfolio as a physics learning assessment. Therefore, further research is needed regarding the application and the development of e-portfolio as a physics learning assessment in school.

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