The Effectiveness of *Electronic Records Information System for Education (ERISE)* Applications as a Learning Media of Record Management in the Era of the Industrial Revolution 4.0

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Abstract. ERISE is an electronic archive application developed to be used as a learning media for Record Management subject. This research aims to; 1) knowing the motivation of students during learning using the ERISE application, and 2) knowing the differences in students' cognitive learning achievement between students who take Archival subject learning using the ERISE application and using PowerPoint media. The study was conducted using a quasi-experimental method with a nonequivalent control group pretest-posttest model. The population of this study consisted of class X SMK OTKP in the Special Region of Yogyakarta and Central Java. The selection of research samples using purposive sampling technique with a target of 104 students. The research instrument used was a questionnaire and an objective test. The research data were analyzed using descriptive statistical analysis and non-parametric statistics, namely the Mann Whitney U Test. The results showed that students' motivation was at a high level when participating in learning using ERISE application, and there were differences in cognitive values between the use of ERISE and PowerPoint. The cognitive learning outcomes score of students after learning using the ERISE application is higher than the score of students after learning using PowerPoint media.

Keywords: ERISE · learning media · effectiveness · industrial revolution 4.0

1 Pendahuluan

Utilization of the internet for smart televisions, smart phones, super computers for managing all information and big data, logistics, shopping, health, transportation are some of the impacts of the digital era that have affected human life (Syamsuar & Reflianto 2018).

The consequences of using advanced technology result in the possible loss of several types of jobs. The loss of these types of work, of course, results in reduced employment opportunities. Brodjonegoro (2018) cites Schwab's writings which identify the types of

jobs that will soon be missing, including remote marketing, tax staff, referee-line judges, other sports officers, legal secretary, land-building intermediary, farm labor contractor, and courier.

The era of the Industrial Revolution 4.0 is a challenge and at the same time it opens up opportunities for us. The challenges faced entering the era of the Industrial Revolution 4.0 occur in aspects: information technology security; reliability and stability of production machines; human resource skills and innovation; and the occurrence of automation which reduces employment (Sung, 2017). Yahya (2018) groups the challenges of the Industrial Revolution 4.0 into five aspects, namely: economic, social, technical, environmental, and regulatory.

In accordance with the principles of Industry 4.0, the Indonesian government through the Minister of Trade of the Republic of Indonesia (2018) has compiled four strategies to face the challenges of the Industrial Revolution 4.0. First, encourage the workforce in Indonesia to continue to learn and improve their skills to integrate internet capabilities with industrial production lines. Second, the use of digital technology to boost productivity and competitiveness for small and medium-sized industries so that they are able to penetrate the export market through the e-smart program. Third, using digital technologies such as Big Data, Autonomous Robots, Cybersecurity, Cloud, and Augmented Reality. Fourth, technological innovation through the development of startups by facilitating business incubation places.

The development of the industrial revolution 4.0 encourages changes that lead to the advancement of the world of education. The development of information and communication technology encourages the development of media and learning processes. Smaldino & Lowther (2008) explained that learning is a variety of efforts made to stimulate learning by setting experiences to help students achieve significant changes in abilities. Learning includes all events and activities that affect the student learning process. In accordance with the development of information technology today, learning is not only limited to classrooms in schools, but can also be in the form of computer-assisted learning and web-based learning. Thus, learning is a process that includes the selection, arrangement, and delivery of information in an appropriate environment and the way individuals interact with the information.

Learning resources in the era of digital information technology can come from various sources including the internet, interactive learning media or videos, so teachers are not the only source of learning. Digital information technology-based learning resources are the most widely used sources, because they can help students in the learning process. Digital information technology can also be used as a facility that helps teachers improve teaching competencies (Budiman, 2019). In addition to utilizing appropriate learning resources, educators must also be good at using learning media. According to Dwihartanti, Sutirman, & Yuliansah (2018), learning media becomes a tool for the learning process whose function is to clarify the meaning of the message conveyed so that learning objectives can be achieved better.

Based on the results of research conducted by Sutirman, Muhyadi, & Surjono (2017) it is known that most of the teachers of SMK OTKP have not mastered digital record materials, so they have difficulty when they have to teach their students. In addition to lack of mastery of the material, most of the SMK OTKP teachers at DIY Vocational

Schools are also still not able to design learning media according to the needs of students, in accordance with learning in the era of the industrial revolution 4.0.

Read & Ginn (2011:5) defines records as information created, received, and maintained as evidence and information for organizations or individuals for legal or business purposes. Quible (2005:475) mentions archives as documents containing information in paper and electronic formats that are used for various activity functions. Digital record management is carried out in stages following the information cycle, starting from the stages of creation, maintenance and use, and positioning (Doran, 2012).

Al-Nuaimy (2001) identified several advantages of online learning, namely: internet browsers software can be used freely, has multi-platform capabilities, can update content and structure easily and quickly, shifts from programming costs to structural and content design costs, more fast in completing the product, does not require much technical support, can control access, and can be used for distance learning. Web-based learning can have a positive impact on students if the learning strategies used support other learning components, in accordance with learning outcomes, facilitate self-directed and collaborative learning, and provide practical activities and feedback (Perlman, 2005).

Howrey and Quinn (2016) suggest that teachers who use e-learning should apply blended learning.

Mukti (2018) explained that learning in the Industrial Revolution 4.0 era was grouped into three models, namely: face-to-face conventional models; online and automation models; as well as blended learning models.

ERISE is a web-based record management information system as a product of research and development carried out by Sutirman, Yuliansah and Kusuma in 2020 to support digital archiving learning in SMK OTKP. The development research conducted in 2020 has only reached the expert validation stage, so it is necessary to proceed to the implementation stage to determine its effectiveness in learning. This research is limited to the problem of not knowing the effectiveness of the ERISE program in increasing motivation and learning outcomes of SMK OTKP students. Although previous research has received a very decent assessment from media experts and material experts, it has not yet been tested for effectiveness on users. Therefore, this research will be conducted to test whether ERISE is effective or not in improving student learning outcomes of SMK OTKP. More specifically, this study aims to determine students' learning motivation and to determine the difference in cognitive values between learning using ERISE and PowerPoint media. This research is very important to help improve the quality of learning in SMK OTKP in accordance with the demands of the industrial era 4.0.

Motivation is defined as an internal drive that directs behavior towards a goal so that it can help individuals overcome inertia (Togia, Korobili, & Malliari, 2011). Motivation is also defined as a series of efforts to provide certain conditions that cause someone to want and want to do something and if they don't like it, someone will try to avoid that feeling of dislike (Emda, 2018). According to Togia, Korobili, & Malliari (2011) learning motivation refers to the way students think about learning activities and processes. Meanwhile, according to Nurhasanah & Sobandi (2019), motivation is an effort or encouragement that is consciously carried out by students to take learning actions and realize directed behavior for the achievement of the expected goals in conditions or situations of teaching and learning interactions. Thus, learning motivation is a conscious

drive from within to direct behavior towards goals in conditions or situations of teaching and learning interactions.

Glynn & Koball (2006) developed a science learning motivation questionnaire consisting of six motivational components, namely:

1. Intrinsic motivation which refers to the extent to which a student feels himself participating in learning such as challenges, curiosity and mastery of the material.
2. Extrinsic motivation which involves various things related to encouragement from outside students in participating in learning such as the influence of grades, awards, performance, evaluation by others or competition.
3. Personal goals regarding the goal setting that has been set related to the achievement of personal learning achievement.
4. Responsibility for one's own destiny which is the will and directs the person according to his own wishes.
5. Confidence in the learning process that convinces students that they have the ability.
6. Anxiety about the assessment that has been received.

Another opinion was expressed by (Emda, 2018) that motivation in learning is divided into intrinsic motivation and extrinsic motivation. Intrinsic motivation is motivation that arises from within the individual student, for example, the willingness to learn is driven by his desire to increase knowledge. While extrinsic motivation is the will or motivation that comes from outside the student. Based on several studies, learning motivation has a positive impact on student achievement.

Learning is a process of change through activities or procedures obtained from training in the laboratory or in the natural environment. Learning outcomes are a final assessment of a process and an introduction that has been done repeatedly and stored for a long time or may never be lost forever. Learning outcomes help shape students into individuals who want to always get better results by how to change mindsets and form better work behaviors (Sjukur, 2013). Learning outcomes are a description of student achievement after going through learning that has been carried out for a certain period (Sutrisno & Siswanto, 2016). Based on the opinion above, it can be seen that learning outcomes are a picture of the final achievement of students obtained after going through long stored learning which is described as a change in thinking and behavior. Learning outcomes are described by the value obtained by students after going through the learning assessment stage based on the basic competencies that have been taken.

2 Metode Penelitian

2.1 Research Design

This research was conducted with a quantitative approach. The method chosen is a quasi-experimental method with a pretest-posttest model of nonequivalent control group design (William & Jurs, 2009) or according to (Jhonson & Christensen, 2008) (Fig. 1).
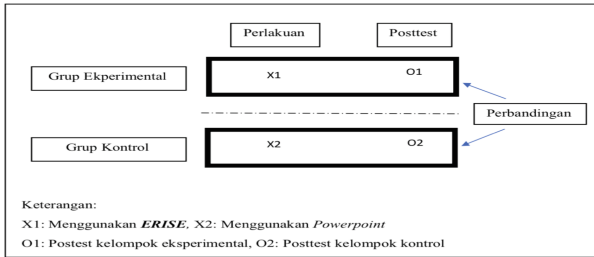
Fig. 1. Pretest-posttest nonequivalent control group design that has been modified (Wiersma & Jurs, 1995: 143; Johnson & Christensen, 2008: 330)

Table 1. The Level of Students' Learning Motivation Using ERISE Media

Scale	Criteria	F	%
Very high	X > 24,2	47	45,19
High	20,4 < X ≤ 25,2	54	51,92
Medium	15,6 < X ≤ M + 20,4	2	1,92
Low	10,8 < X ≤ M − 15,6	1	0,96
Very low	X < 10,8	-	0
Total		104	100

3   Results and Discussion

3.1   Results

3.1.1   Level of Student Learning Motivation

The level of student motivation in learning using the ERISE application is presented in the following Table 1.

Table 1 shows that the level of student motivation in learning using the ERISE application is mostly in the high category as many as 54 people or 51.92% and very high as many as 47 people or 45.19%. Meanwhile, as many as 2 people or 1.92% in the medium category and 1 person or 0.96% in the low category.

3.1.2   Differences in Cognitive Learning Outcomes

Table 2 presents data on pretest and posttest scores for learning using the ERISE application and using PowerPoint as the media. Judging from the posttest results, the scores of students who used ERISE were higher than those of students who used PowerPoint.

To determine the significance of the difference, data analysis was performed using non-parametric statistical analysis with the Mann-Whitney U test technique. The decision-making process is carried out with an error rate of 5%, with criteria Ho can be accepted if Asymp. Sig. (2-tailed) > 0.05. The following are the results of the analysis using the Mann-Whitney U test technique.

Table 2. Comparison of student scores

Learning outcomes	Pretest	Posttest	Increase	%
Cognitive (PowerPoint)	48,17	79,3	31,13	64,62%
Cognitive (ERISE)	48,17	82,26	34,09	70,81%

Tabel 3. Results of Mann-Whitney Test

	Pengetahuan
Mann-Whitney U	4284,500
Wilcoxon W	9744,500
Z	-2,595
Asymp. Sig. (2-tailed)	.009

The summary of the results of data analysis in Table 3 shows a P value of 0.009. P VALUE (0.009) < 0.05. In accordance with the decision-making criteria, the hypothesis Ho is rejected, therefore it is concluded that: **there is a difference in cognitive learning outcomes between learning using the ERISE application and Powerpoint media.**

3.2   Discussion

3.2.1   Student Learning Motivation

The web-based ERISE application is able to provide new experiences for students in learning electronic record management, so that it can stimulate learning motivation. These results are relevant to the findings of previous studies about the advantages of website-based learning media in improving students' understanding and learning motivation (Abd Rashid, 2016; Cook, 2007; Poon et al., 2004). Through the web-based ERISE application students can learn independently, feel for themselves, get real experiences, and find their own concepts. In accordance with the cone of experience of Edgar Dale (1969) that learning carried out with real experience will have an impact on the absorption of learning up to 90%.

3.2.2   Differences in Cognitive Learning Outcomes between the Use of ERISE Applications and Powerpoint Media

Full online learning policies are still something foreign, especially at the secondary and primary education levels (Arlinwibowo et al., 2020; Nur et al., 2020; Rusmiati et al., 2020; Shaharanee et al., 2016). Online learning, especially in vocational schools, has its own challenges because learning in vocational schools requires the achievement of learning outcomes in the form of knowledge and skills. During the Covid-19 pandemic, online learning has not been able to provide a learning experience to achieve good

learning outcomes. Teachers assume that during learning it is difficult to maintain student motivation in the learning process (Khusni Syauqi et al., 2020; Rusmiati et al., 2020).

Utilization of web learning can also increase interaction between students (Inayat et al., 2013; Puspitasari et al., 2018).

The results showed that the average posttest score of students using ERISE media was 3.37% higher than the average posttest scores of students using PowerPoint media. The results of this study are in accordance with the findings of Geisert & Futrell, (2000); Inayat et al., (2013) that learning using web-based (WBL) can improve students' learning experience because students feel the sensation of learning for themselves, collaborate with others, and make a positive contribution to learning outcomes. In addition, the use of WBL also provides many benefits for the learning process, namely it can be used for distance learning, student-centered learning / SCL, instilling high-level skills, saving time, costs and increasing learning motivation (Abd Rashid, 2016; Cook, 2007; Puspitasari et al. 2018).

This statement is proven because the level of student learning motivation after using the ERISE application is at a high level. This contradicts the findings by (Child, 2020; Khusni Syauqi et al., 2020; Mulyanti et al., 2020; Syah, 2020) that the distance learning process burdens students, reduces the quality of student skills and has not provided a better experience for students. Students in mastering competence.

The results of the research above can also prove that through learning using the ERISE application students have gained new learning experiences through information system-based websites which usually only listen to lectures using PowerPoint. Interest from the learning experience can make students motivated to learn, then this will lead to an increase in understanding of the learning material and will ultimately contribute to improving learning outcomes (Filgona et al., 2020; Moulaert et al., 2004; Vansteenkiste et al., 2004).

4   Conclusion

The results showed that students' motivation was at a high level when participating in learning using ERISE aplication, and there were differences in cognitive values between the use of ERISE and PowerPoint. The cognitive learning outcomes score of students after learning using the ERISE application is higher than the score of students after learning using PowerPoint media.

Authors' Contributions. The author 1 contributed to drafting research proposals, designing ERISE application designs, and writing articles.

The author 2 contributed in making data collection instruments and conducting research data analysis.

The author 3 contributed to the research data collection process.

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