THE EFFECTIVENESS OF THE LEARNING MANAGEMENT SYSTEM OF SAQURAL LEARNING APPLICATION ON THE SCIENTIFIC INTERPRETATION LEARNING OUTCOMES

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ABSTRACT

This study aims to obtain an effective BERSAQURAL Learning Management System on the learning outcomes of BERSAQURAL interpretation through digital literacy. This study is a quantitative type with One-Group Pretest-Posttest Design. This study population was 90 third-semester science education students at the Faculty of Teacher Training and Education IAIN Salatiga who participated in a science interpretation course. The sample in this study was purposive sampling, and one group is 30 students. The data collection instrument was pretest and posttest questions of the BERSAQURAL interpretation of water. The results showed that: (1) the BER-SAQURAL learning management system in the dashboard consists of the navigation menu, interpretation of science, nature, al-Qur'an, e-Problem Based Learning, evaluation, explore material, user, my profile, settings, and logout; (2) BERSAQURAL learning management system is effective on learning outcomes of BERSAQURAL interpretation through digital literacy based on the Wilcoxon test (t count -4.802, p = 0.00 <0.05). Research results of learning management system BERSAQURAL have novelty, a distance learning media (online) with open-access material as digital literacy, connecting LMS E-PBL Berketemu Ilmiah (e-pblberketemuilmiah.id) integrated with a plagiarism checker to educate honesty. There are rewards from users of the BERSAQURAL Learning Management System in the stars or on the trending menu.

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Keywords: LMS; scientific interpretation; saqural

INTRODUCTION

The COVID-19 pandemic has an impact on the implementation of teaching and learning activities. The usual face-to-face teaching and learning activities now turned into distance learning. Erduran (2020) stated that learning has shifted to virtual learning during the COVID-19 pandemic. Learning assignments and evaluations are also carried out through online learning. Distance learning or online learning requires adaptive media, methods, and strategies so that students can receive learning messages with the same quality as face-to-face learning. The usual face-to-face science learning (conventional) changed to online learning by involving distance-oriented technology. The results of research conducted by Atista and Kuswanto (2018), Maulana et al. (2019), Solikhin et al. (2018), Sahida and Zarvianti (2019) showed that the urgency of online learning in the era of the industrial revolution 4.0 provides color in the education world.

At the higher education level, as a place for learning activities, it is demanded to prepare reliable graduates in utilizing various kinds of advanced technology to compete in the job market. Online learning innovation is one option and a necessity for educators to convey distance learning messages. Today's distance learning provides easy access to digital learning materials. This is following the results of preliminary research conducted by this research team, Saputro et al. (2020), which stated that online learning and integrated learning (integration of science, al-Qur'an, and nature) are needed by educators in the era of the industrial revolution 4.0 and the COVID-19 pandemic, as well as a portrait of the current real condition of learning the BERSAQURAL interpretation. BERSAQURAL is an acronym from Based on Science, al Qur'an, and Natural. It is a collaborative research & development product, and in the field of science and Islamic education is based on the need for integrated science interpretation learning innovations in the era of industrial revolution 4.0. BERSAQURAL is a website-based learning platform designed with open-source material, adaptive with problem-based learning equipped with plagiarism checkers, download facilities, and rating menus.

The preliminary research results in detail are: (1) the real conditions of BERSAQURAL interpretation learning have not used applications, BERSAQURAL learning materials have not been made, and there is no BERSAQURAL learning evaluation; (2) the level of needs analysis is as follows: the average score of the digital learning model is 3.61 (Highly Need), the average score of the BERSAQURAL learning strategy is 3.41 (Need), the average score of BERSAQURAL learning implementation is 3.54 (Highly Needed), the average score of the social-religion applicability of the application is 3.53 (Very Needed). (3). The e-BERSAQURAL draft was designed with open-access material, adaptive to e-problem based learning, equipped with a plagiarism checker, download, and rating menu.

Based on the preliminary study results, some research results relevant to this study are research conducted by Huda et al. (2018), which showed that online learning resources could improve student performance and achievement. According to Dewi et al. (2019), scientific literacy development is needed to prepare the next generation of scientific literacy with a curriculum that pays attention to culture and everyday life to make it more contextual. Ngabekti et al. (2019) concluded that the STEM mobile ecosystem learning package has good validity and readability and is effective in students' science and technology literacy. Meanwhile, according to Budiaman (2010), the use of the internet as a learning medium in general increases learning motivation. Asrizal et al. (2018) showed that using integrated science instructional materials can solve integrated science teaching problems and improve students' digital literacy in scientific, functional, and visual literacy. This digital literacy component is also useful for students to gain success in their real future life. According to El-Khalili and El-Ghalayini (2014), student learning achievement and student perceptual satisfaction increase with learning objects designed with advanced learning technology so that they are better at achieving targeted learning goals. Hong and Xinyi (2019) showed that online learning resources could help to achieve learning goals. The research results by Oktavianti et al. (2018) showed that students' scientific explanation skills significantly increase after they experience blended learning physics with e-scaffolding. Wang (2019) showed that blending learning has a significant effect on increasing the effectiveness of digital art teaching. According to Wahyuni et al. (2019), science learning with the Edmodo-based blended learning model can motivate learning and improve students' critical thinking skills. The research findings of Chootongchai and Songkram (2018) revealed that online learning systems positively influence students' thinking and innovation abilities. According to Songkram (2017), online learning can increase students' creativity scores and innovative skills.

Wiana et al. (2018) showed that interactive multimedia based on motion graphics effectively improves student learning in concept mastery indicators and fashion design in digital format. According to Shang (2016), Wechat can be feasible, comfortable, and efficient distance learning. Chatwattana (2017) showed that the website learning system allows students to learn from the system efficiently. Besides, there are various communication tools to support and promote collaboration and activities within the system. Zahroh (2015) stated that the e-learning-based integrated social studies learning model has the objectives of providing very supportive or adequate facilities and infrastructure, accelerating the expansion of education opportunities, and impro-

ving the quality of education. Those are under the objectives of technology in learning to solve problems and facilitate student learning activities. Aripin (2018) showed that teachers must be able to create and develop mobile learning content because, for now, such media is what students are interested in and widely used in their daily life. Research conducted by Wang & Jiang (2018) showed that online learning has practical value in its implementation. Pertiwi & Sumbawati (2018) showed that there is no interaction between the use of learning media learning management system chamilo and powerpoint on learning motivation F count (0.159) < F table (4.00). While Listiawan (2016) student learning outcomes who use a combination of classroom learning and using the Learning Management System 2.44% entered the failed category

Educators have made various efforts and distance learning media at this time. Online learning and digital literacy are facts that occur and are experienced by educators and students today. The term e-learning covers various applications and processes, such as computer-based learning, web-based learning, and virtual classrooms. Meanwhile, online learning is part of technology-based learning that utilizes the internet, intranet, and extranet resources. Online learning through the website requires a learning management system in its implementation and stages to get its effectiveness. Related to this, researchers have previously conducted research. The results are that the application of e-problem based learning based on scientific communication skills requires a learning management system. Before the implementation stage, the Learning Management System application of E-Problem Based Learning based on scientific communication skills and plagiarism checker is the expert validation stage (Saputro et al., 2020). Another research conducted to strengthen this research is designing an integrated scientific interpretation learning model that requires expert validation stages (Saputro et al., 2020). The expert validation stage is the stage of research and development that will be continued in product testing and the effectiveness of the research product.

Meanwhile, Tubagus et al. (2020) showed that the Learning Management System (LMS) is a learning process that utilizes computer information technology equipped with internet and telecommunication multimedia facilities (graphics, audio, video). The test result t = -37, 43 (p <0.05) means that the LMS effectively affects student learning outcomes. According to Fathema et al. (2015), the attitudes and behavior of higher education institutions towards the Learning Management System in learning are significant. Based on several previous studies by researchers and other relevant research results, it is different from this study. The difference is that the developed BERSAQURAL learning management system is open-access to BERSAQURAL interpretation material as digital literacy, which students and the community can use, and connect LMS E-PBL Berketemu Ilmiah (e-pblberketemuilmiah. id) is integrated with the plagiarism checker. This study aims to obtain an effective BERSAQURAL Learning Management System for the learning outcomes of BERSAQURAL interpretation (Saputro et al., 2020). The novelty of this research is the Learning Management System which can access BERSAQURAL interpretation material freely as digital literacy, and connecting LMS E-PBL Berketemu Ilmiah (e-pblberketemuilmiah. id) is integrated with the plagiarism checker.

METHODS

The type of this research is a quantitative study with the one-group pretest-posttest design. The procedure for this design is the pretest score obtained from the students' pretest score before learning using the BERSAQURAL Learning Management System, while the posttest score is obtained from the students' posttest score after learning using the BERSAQURAL learning management system. The research design "One-Group Pretest-Postest Design" is shown in Figure 1.

$$O_1 \qquad X \qquad O_2$$

Figure 1. One-Group Pretest-Postest Design (Dantes, 2017)

Based on Figure 1, O_1 is the pretest score of the BERSAQURAL interpretation before treatment, X is the learning treatment using the BERSAQURAL Learning Management System for the BERSAQURAL interpretation of water, and O_2 is the postest score after treatment. The research design of this activity is in Table 1.

Table 1. The Research Design of the Activity

Pretest	Treatment	Posttest
Measuring students' knowledge of the BERSAQURAL interpretation of water. The questions are five essay questions related to the BERSAQURAL interpretation material with the score for each item is 20, so the maximum total is 100	Learning using the Learning Management System BERSAQURAL interpretation of water.	Measuring students' knowledge of the BERSAQURAL interpretation of water. The questions are five essay questions related to the BERSAQURAL interpretation material with the score for each item is 20, so the maximum total is 100

This study population was 90 third-semester science education students at the Faculty of Teacher Training and Education IAIN Salatiga who participated in a science interpretation course. The sample, according to Sugiyono (2015), is part of the number and characteristics of the population. The samples in this study were 30 third-semester science education students, selected purposive sampling.

The data was collected using instruments in the form of the pretest and posttest questions about BERSAQURAL interpretation of water. Data collection methods were pretest and posttest. The results of the pretest and posttest are in the form score of learning outcomes of BERSAQURAL interpretation of water. The t-test followed the pretest and posttest data on the learning outcomes of BERSAQURAL interpretation of water. The validity and reliability of the pretest and posttest essays used the validity prediction and the validity content. If the data is normally distributed, a parametric test (paired t-test) is performed. If the data is not normally distributed, then a non-parametric test is performed (Wilcoxon test).

RESULTS AND DISCUSSION

The developed BERSAQURAL learning application has gone through preliminary studies, needs analysis, drafting of BERSAQURAL learning application products, focus group discussions, expert validation, individual trials, group trials, and e-BERSAQURAL limited trials.
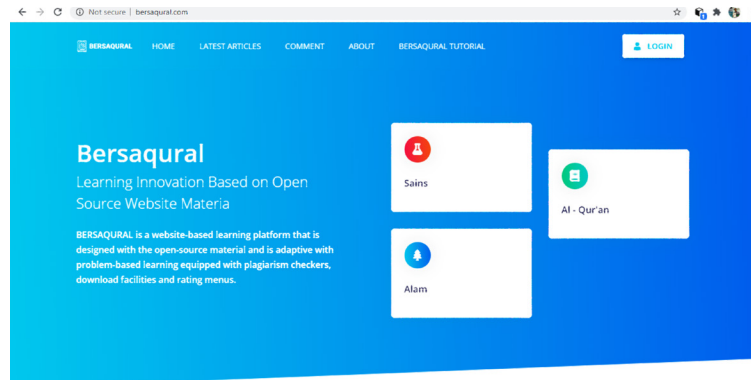
Figure 2. The Front Page of e-BERSAQURAL (Source: Document of Research Results, 2020)

The BERSAQURAL learning application can be accessed through http://bersaqural.com/. Figure 2 is the front page of e-BERSAQURAL.

The front page of http://bersaqural.com/ consists of the menu of home, latest articles, comments, about, BERSAQURAL tutorial, and log in. The home menu contains information and characteristics of http://bersaqural.com/ innovations. The latest articles menu contains notifications and BERSAQURAL interpretation learning materials that have been submitted by lecturers and can be downloaded by anyone without logging in because it is open-access. Visitors of http://bersaqural.com/ can click on the latest articles to get BERSAQURAL interpretation material, and they will find the menu of download and back. They can read or download the material. After visitors download the material, they can click the back menu to return to the front page. The comment menu contains the comments column for http://bersaqural.com/ users and visitors. The About menu includes historical and novelty information from the results of BERSAQURAL research. The BERSAQURAL tutorial menu consists of a guide to use http://bersaqural.com/. The login menu contains the username and password columns to go to the BERSAQURAL learning management system.

The BERSAQURAL learning management system can be found after logging in. After the user logs in, they will find a dashboard with a navigation menu located on the far left side. There are ten menus, interpretation (consisting of science, nature, al-Qur'an), e-Problem Based Learning, evaluation, explore material, and user. On the right, there is a menu of My Profile, Settings, and Logout. BERSAQURAL learning management system is as shown in Figure 3.
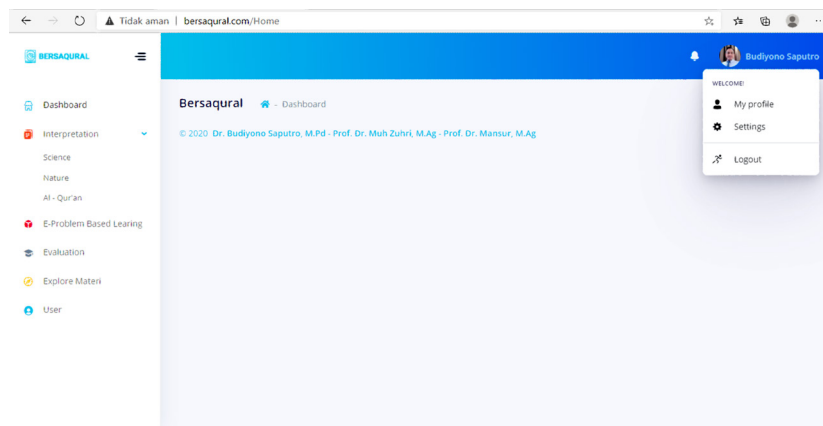

Figure 3. BERSAQURAL Learning Management System (Source: Document of Research Results, 2020)

The description of the function of the BERSAQURAL Learning Management System in detail is as follows: (1) the science interpretation menu; (2) the nature science interpretation menu; (3) the science Qur'an interpretation menu. Those three functions are used to make posts and edit the BERSAQURAL interpretation material by clicking the add interpretation menu. After posting and editing the material, the user can click the BERSAQURAL interpretation category option menu and save the material via the Save menu; (4) the e-Problem Based Learning menu is used for BERSAQURAL interpretation learning, which can be done with the Problem-based Learning application integrated with a pla- giarism checker; (5) menu evaluation is used to post and edit questions by clicking the add interpretation menu. After making posts and editing questions, the user can click the save menu; (6) the Explore Materi menu is to search for literature and is directly connected to Google; (7) the user menu is used to create a username and password; (8) my Profile menu is to create personal user data; (9) the settings menu is used to make settings by the admin; (10) the logout menu is to exit e-BERSAQURAL.

The Syntax of BERSAQURAL Learning Management System interpretation material is in Figure 4 and Table 2.
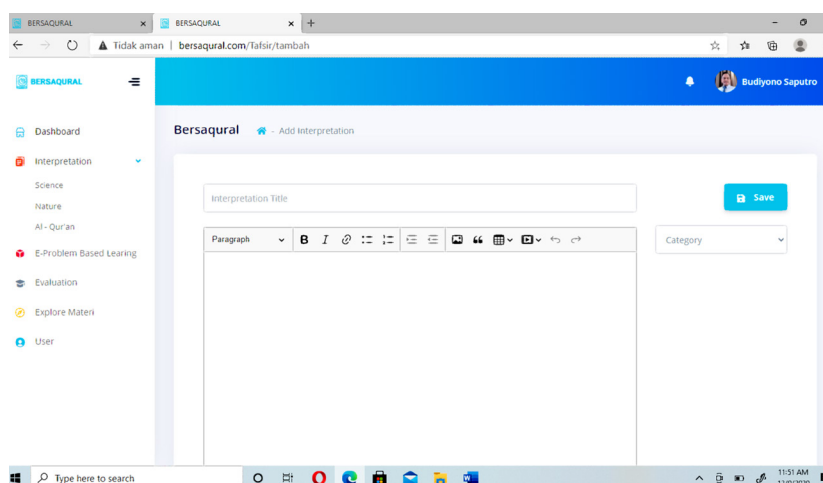
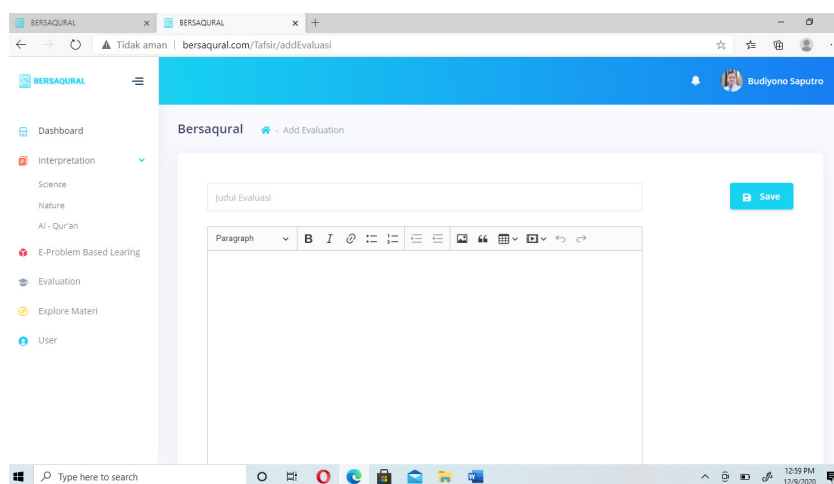**Figure 4.** The Syntax of BERSAQURAL Learning Management System Interpretation Material (Source: Document of Research Results, 2020)

BERSAQURAL interpretation material by lecturers or account users as in the syntax of Table 2 and Figure 4 will automatically become digital literacy that can be accessed by students and anyone who wants to read. Students can log in with a password and username to join the lessons, discussions, evaluations, and submitting assignments.

Table 2. The Syntax of BERSAQURAL Learning Management System Interpretation Material

Stages	Description	Output
First	The user clicks the menu "add interpretation material."	Column to post title and material
Second	The user makes and inputs the title of BERSAQURAL interpretation material.	The title of BERSAQURAL interpretation material
Third	The user makes and inputs the BERSAQURAL interpretation material.	BERSAQURAL interpretation material
Fourth	The user saves the BERSAQURAL material by clicking Save.	The BERSAQURAL interpretation material is published on the front page.

The digital literacy material of this research is the BERSAQURAL interpretation of water, as shown in Figure 5.
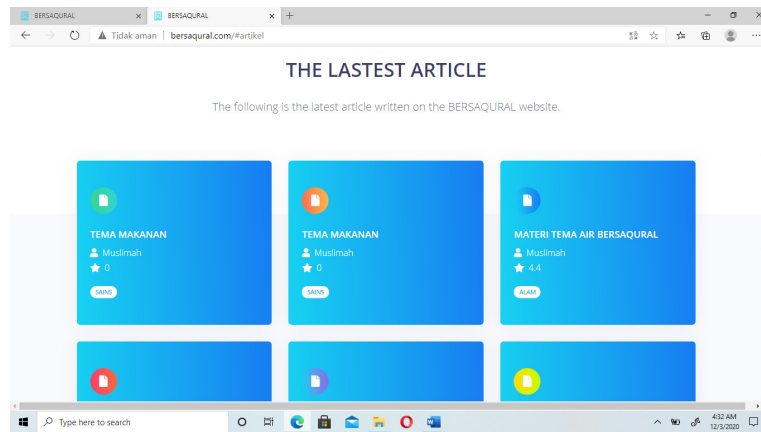
Figure 5. Digital Literacy Material for BERSAQURAL Interpretation of Water (Source: Document of Research Results, 2020)

The BERSAQURAL interpretation material of water as digital literacy in Figure 5 is as follows: The verses of the al-Quran used as the basis for the BERSAQURAL material about water are QS Al-Baqarah 22 and 164, QS. Al-An'am 99, QS Al-Anfal 11, QS Ibrahim 32, QS. An-Nahl 10. Scientific cues are obtained from these verses from the Qur'an and are used to determine the theme of learning. The verse fragment *mãan* (water) is a singular noun (*isim mufrod*) and an abstract or adjective noun. Therefore, the mention of water in the Qur'an is not only interpreted as a water molecule but also includes various creations related to water as a source of life (Imamudin, 2012). Through scientific signals, *mãan* in *hissi* manner can be identified in terms of the physical, chemical, and biological features of water molecules in life. Some of the processes that can maintain water on earth include evaporation, transpiration, guttation, and respiration. This *hissi* knowledge can provide various factual information to increase faith and piety for people who think. Allah SWT sends water from the sky to the earth, and Allah SWT provides sustenance from that water. The word *rezeki* (*rizqan*) can be interpreted as anything to maintain life (given by God); food (daily); living; livelihood; income (money and others to maintain life); advantage; opportunity to eat. Water is the source of life; with it, the dry earth can become fertile, the creation of the heavens and the earth are all for the needs of humans and other living creatures, then humans should pay attention to and reflect on the grace of Allah, the Most Holy, His knowledge of the nature of His creation will increase, this knowledge can be utilized as desired by Allah SWT.

BERSAQURAL interpretation learning materials about water as digital literacy delivered by lecturers are evaluated through e-BERRSAQURAL with the syntax of BERSAQURAL

Learning Management System interpretation evaluation, and the principle is the same as the Material Learning Management System syntax.

Phase details, job descriptions, and the syntax output are shown in Table 3 and Figure 6.

Table 3. Syntax of Learning Management System BERSAQURAL Interpretation Evaluation

Stages	Description	Output
First	User clicks Interpretation Evaluation	Column to post title and questions
Second	User makes and inputs the question title of BERSAQURAL interpretation.	The question title of BERSAQURAL interpretation
Third	User makes and inputs the questions of BERSAQURAL interpretation.	The questions of BERSAQURAL interpretation
Fourth	The user saves the questions by clicking Save	The questions of BERSAQURAL interpretation are published on the e-BERSAQURAL system.

Moreover, the figure 6 below illustrates the Syntax of BERSAQURAL Learning Management System Interpretation Evaluation in e-BERSAQURAL.

Figure 6. The Syntax of BERSAQURAL Learning Management System Interpretation Evaluation (Source: Document of Research Results, 2020)

The applicability of the BERSAQURAL Learning Management System to the learning outcomes of the BERSAQURAL interpretation of water through digital literacy can be measured through the effectiveness of the implementation of e-BERSAQURAL. Before the e-BERSAQURAL effectiveness test is carried out, the prerequisite test is carried out first, namely the descriptive test and the normality test. Table 4 is the pre-post descriptive test of the e-BERSAQURAL material.

Table 4. Descriptive Pretest and Posttest

	N		Mean	Median	Mode	Std. Deviation	Variance	Min	Max	Sum
	Valid	Missing								
Pretest	30	0	61.0000	55.0000	50.00	11.77373	138.621	50.00	75.00	1830.00
Posttest	30	0	86.5000	85.0000	85.00	6.31774	39.914	75.00	95.00	2595.00

Table 4 shows the results that the research respondents were 30 students with descriptive details of the pretest data as follows: mean = 61.00, median = 55.00, mode = 60.00, minimum = 50.00 and maximum = 75.00. While the descriptive details of the posttest data are as follows: mean = 86.50, median = 85.00, mode = 85.00, minimum = 75.00 and maximum = 95.00. Pretest and posttest data are obtained before the t-test, then the data normality test is carried out with the results as in Table 5.

Table 5. Data Normality Test

	Shapiro-Wilk		
	Statistic	df	Sig
Pretest	0.710	30	0.000
Posttest	0.897	30	0.007

Based on the results of the data normality test using the Shapiro-Wilk SPSS, the significance of the pretest was 0.000 $p < 0.05$, and the postest was 0.007 $p < 0.05$. Based on these results, it can be concluded that the pretest and posttest data were abnormally distributed. Thus, the effectiveness test used Wilxocon. The Wilcoxon test results are as shown in Table 6.

Table 6. Wilcoxon Test Results

	Posttest – Pretest
Z	-0.4802
Asymp. Sig. (2-tailed)	0.000

Based on the Wilcoxon test, the t count was -4,802. At the same time, $p = 0.00 < 0.05$, then Ha was accepted, and Ho was rejected, which means that the BERSAQURAL learning management system is effective on learning outcomes of BERSAQURAL interpretation through digital literacy in science education students at the Faculty of Teacher Training and Education IAIN Salatiga. The result is in line with Saputro et al. (2020) that the website-based Learning Management System learning platform is adaptive for students, and they can learn independently. Meanwhile, according to Coates et al. (2005), the Learning Management System in learning can provide student involvement in academic knowledge and evaluation. Lonn and Teasley (2009) stated that the Learning Management System is effective, efficient, and innovative beyond being interactive for instructors and students in learning. Instructors and students can share materials, give and submit assignments, and communicate online through the Learning Management System. The research results of Saputro and Tri Susilowati (2019) showed that the learning management system on In-Network Learning System (SPADA) Based on Scientific is effective on student learning outcomes of pedagogical material. Rizal et al. (2020) showed that the satisfaction level of students' use of LMS is high (76.03% on average), and the most influential predictor variables are the experience using LMS and age. Isdaryanti et al. (2018) showed that science learning management integrated with character education is very good. Widodo et al. (2020) revealed that interactive multimedia was developed effectively to improve students' scientific literacy, but Gen Z students suggested that

multimedia enter the device/platform to be accessed anytime. Afriana et al. (2016) said that project-based learning integrated with STEM (Science, Technology, Engineering, and Mathematics) could increase scientific literacy more significantly. The results of this study were corroborated by research by Afriana et al. (2016) and Parno et al. (2020), which stated that the STEM (Science, Technology, Engineering, and Mathematics) learning model and problem-based learning could improve students' scientific literacy. Al Musawi (2011) showed that online pre-posttest interactions could be used to measure the achievement of interactional goals.

Based on these discussions and discussions, the developed BERSAQURAL Learning Management System can be a solution and alternative to online or distance learning effective for learning outcomes of BERSAQURAL interpretation. The BERSAQURAL Learning Management System is also adaptive to the LMS E-PBL Berketemu Ilmiah (e-pblberketemuilmiah.id), open-access material. The BERSAQURAL Learning Management System can contribute to educating honesty with a plagiarism checker. There are also rewards from users of the BERSAQURAL Learning Management System in stars or on the trending menu.

CONCLUSION

The BERSAQURAL learning management system is effective in learning outcomes of BERSAQURAL interpretation of science education students at Faculty of Teacher Training and Education IAIN Salatiga. The Wilcoxon test results obtained t-count -4.802, while $p = 0.00 < 0.05$. The developed BERSAQURAL Learning Management System consists of ten navigation menus: (1) the science interpretation menu; (2) the nature science interpretation menu; (3) the Qur'an science interpretation menu; (4) the e-Problem Based Learning menu; (5) evaluation menu; (6) explore material menu; (7) user menu; (8) my profile menu; (9) settings menu; (10) logout menu. Meanwhile, digital literacy on the front page of e-BERSAQURAL is open-access. The BERSAQURAL learning management system has the following novelties: (1) open-access to BERSAQURAL interpretation material that students and visitors can download; (2) adaptive to the LMS E-PBL Berketemu Ilmiah (e-pblberketemuilmiah.id) integrated with a plagiarism checker and an on trending menu; (3) distance learning solutions; (4) educating honesty with a plagiarism checker and rewards from users of the BERSAQURAL Learning Management System in stars or on trending menu.

ACKNOWLEDGEMENTS

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