The Effectiveness of Quizizz Application as a Learning Evaluation Instrument Towards 5.0 Society Era in the Set and Logic Course

Suci Dahlya Narpila[1(✉)], Sri Wahyuni[2], Hetty Elfina[3], and Salimah Angreiny Nasution[4]

[1] Faculty of Tarbiyah and Teacher Training, State Islamic University of North Sumatera, Jl. Williem Iskandar Psr V Medan Estate, Medan 20731, Indonesia
sucidahlyanarpila@uinsu.ac.id
[2] Faculty of Education and Teacher Training, Muhammadiyah University of North Sumatera, Medan, Indonesia
[3] Faculty of Technique, University of Pembinaan Masyarakat Indonesia, Medan, Indonesia
[4] Islamic Senior High School, Number 2, Medan, Indonesia

Abstract. This study focused on finding the effectiveness of the Quizizz application as a learning evaluation instrument in the set and logic course of the Mathematics Education Department, State Islamic University of North Sumatera, Indonesia. This research was an experimental quantitative research with a one-shot case study design. The participants in this study were 28 students of the mathematics education department at UINSU Medan in the second semester of 2020/2021. This study used student response questionnaires and the sets and logic test using the Quizizz application as a data collection instrument. The student response questionnaires found that excellent category was 57.2%, and the good category was 42.8%. Another result showed that the percentage of completeness was 92.8% and exceeded 75% of the total number of students. This data showed that the Quizizz application is an effective learning evaluation instrument in the set and logic course.

Keywords: Effectiveness · Quizziz · Evaluation · Society 5.0 · Set and Logic

1 Introduction

Continuous development is inevitable in human life. Humans must be ready to face all forms of development in various lifelines. One of the most rapid developments in human life is in the field of technology. Due to their rapid development and profound effects on the standard of human existence, technological advancements are constantly in the public eye.

In recent years, a breakthrough has been made by Japan as a superpower country on the Asian continent. They introduced a new concept called the era of smart society 5.0. This concept was inaugurated on January 21, 2019, and became a resolution of the industrial revolution 4.0 that previously became their grip [1]. Principally, the concept

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of the smart society era is a refinement of the previous industrial revolution 4.0 concept. With the advent of the smart society 5.0 era, technology is part of human life. In other words, the internet is not just a place to share information, but it plays a role in every line of human life [2]. In principle, the industrial revolution 4.0 and the era of smart society 5.0 present no significant differences. Both of these concepts offer the rapid development of technology, computers, and the internet. Industrial revolution 4.0 focuses on using technology so that digitalization and artificial intelligence dominate all human life [3]. Industrial revolution 4.0 has resulted in a minor role for humans, lowering the presence of humanity as they have been replaced by various technologies. It is what then underlies the emergence of the era of smart society 5.0, which focuses on repositioning humans as the main component [4].

In relation, Indonesia must be prepared to face the era of society 5.0. The preparations began to be carried out in various aspects of Indonesian human life, including in the field of education. It was stated by Sumarno [5] that two crucial elements determine a nation's direction and goals, namely education and culture. Through education, Indonesian people can cultivate their creativity, critical thinking, and ability to communicate and collaborate with others. Consequently, the paradigm in education should be adjusted to welcome the era of society 5.0. One form of change is, for example, minimizing the role of educators as *learning providers,* leading students to be more creative and motivated in learning. Trilling and Fadel [6] argue that 21st-century skills consist of (1) life and career skills, (2) learning and innovation skills, and (3) information media and technology skills. This set of skills will guide learning 5.0, facilitating students to gain 21st-century life skills or better known as 4C, namely creativity, critical thinking, communication, and collaboration [7].

According to Farana et al. [8], there are at least three obligatory elements for educators in the era of smart society 5.0., including the *internet of things (IoT), Virtual/Augmented reality*, and the use of *Artificial Intelligence* (AI) in education to identify the learning needs and students' needs. However, teachers' roles cannot be completely replaced by technology since technology cannot develop students' emotional bonding, enthusiasm, or self-confidence.

The Internet of Things, often abbreviated as IoT, is one of the essential aspects in the era of smart society 5.0. IoT can be defined as a concept where an object is attached to particular technology or software to facilitate communication between humans. In the world of education, IoT can also be applied during learning. The existence of IoT can help communication between educators and students, creating a more effective and efficient learning process. IoT can be adopted in the learning process through the use of technology devices as a learning media or as a learning evaluation tool. By using this technology, it is hoped that learning can run smoothly, effectively, and efficiently.

An application of IoT can be realized by using technology in the evaluation of learning. So far, educators tend to ignore the learning evaluation process. They only focus on the learning process and ignore evaluation activities. They mostly concentrate on just coming to class, teaching, and achieving the curriculum target at the end of the semester [9]. Consequently, there is the practice of score manipulation, which negatively impacts student development. Huljannah [10] explained that most teachers neglect the evaluation process due to their inability to carry out the learning evaluation process.

Most teachers still evaluate learning manually, for example, by using the paper-based test. This type of evaluation presents a number of drawbacks, such as the emergence of cheating, acts of collaborating with friends, and so forth. Sometimes, students also feel pressured to follow this evaluation technique. Students commonly experience great boredom in attending traditional paper-based evaluations. As a result, students do not focus on the evaluation. So the test results do not represent each student's ability properly. For this reason, innovation in learning evaluation is needed. In line with the concept in the era of smart society 5.0, technology should be incorporated into the learning evaluation. Through the use of technology, learning evaluation will be more straightforward, effective, and efficient since students no longer use paper. Likewise, in the implementation process, the evaluation using technology can be made more attractive to increase student motivation. Additionally, it also enhances students' preparation to face the era of smart society 5.0.

One of the digital technologies that can be used to evaluate learning is the Quizizz application. Quizizz is a software developed by Ankit Gupta and Deepak Joy Cheenath from Bengaluru, India [11]. Noor [12] defined Quizizz as an interactive quiz game that can be applied to classroom learning. According to this understanding, Quiziz is very suitable to be used as a learning evaluation instrument. This game-based media can also maximize student motivation so that he will be bound by the subject [13]. In addition, according to Jusuf [14], interactive games can increase students' interest and enthusiasm for continuous learning. Due to the positive benefits of using games as a learning medium, many teachers have started using various interactive games as learning evaluation tools.

From the specifications, the Quizizz application has a very attractive appearance. The colorful display and its musical instrument transform test or exam activities to be more enjoyable. Quizizz can also be designed using time as a timer, lowering the chance for students to cheat. Teachers can also display questions randomly to students. Consequently, students are more focused on doing their exams which gives them no chance to collaborate with other students.

At the end of the test using the Quizziz application, the teacher can also see students' progress when working on questions [15]. Simultaneously, the application also shows the number of student answers, student scores, and analyses per item. Teachers get much information through test results using this Quizziz application. Additionally, students can also take tests using the same questions repeatedly, allowing students to practice their abilities or answer their curiosity about the answers to the test. Students can also access the test using the Quizizz application anywhere, not necessarily in the classroom, facilitating student learning process.

Given the unique specifications of this Quizizz application, this application becomes an alternative for a learning evaluation tool following the principles of the smart society 5.0 era. With this Quizizz application, it is hoped that tests or learning evaluations can be carried out more pleasantly and not become a burden for students. In addition, students can also develop their knowledge by taking tests using the Quizizz application wherever and whenever they need it. Accordingly, it enhances the quality of learning. Students will also become a generation that is more responsive to using technology in their lives so that they are ready to welcome the era of smart society 5.0.

2 Method

This research was experimental quantitative research with a one-shot case study design [16]. In this design, one class was given treatment. The data was about the students' evaluation results.

This research was conducted at the State Islamic University of North Sumatera (UINSU), Indonesia, with the population from students of the mathematics education study program at UINSU Medan in the first semester of the 2020/2021 academic year. The samples were 28 students of the mathematics education study program in PMM 1 class. The sampling was carried out through the purposive sampling technique. According to Arikunto [17], purposive ensures that the sample can represent the population.

The effectiveness of the Quizizz application was observed from two aspects, namely student responses and student learning outcomes. To see the effectiveness, the researcher collected two types of data, namely student quiz results and student experience in using the Quizizz application. This data was obtained through the implementation of the Quizizz application as an evaluation instrument, while student response was obtained through questionnaires using Google Forms. The data were analyzed using descriptive statistical analysis and inferential statistical analysis.

3 Results and Discussion

3.1 Analysis of Students' Response

The data on students' experience in using the Quizizz application were obtained through the questionnaire. The analysis results on students' experience are presented in Table 1 and Fig. 1.

Table 1 explains that 16 and 12 students present excellent and good responses in using the Quizizz application, respectively. This data signifies students' positive response to the use of the Quizizz application, indicating that the application enhances the effectiveness of the ongoing learning process.

Figure 1 illustrates that 57.2 and 42.8% of students gave excellent and good responses. This data confirmed that >75% of students gave good responses. Based on the effectiveness criteria stated by Arifki [18], if the student response data >75% is obtained, then the learning media can be classified as effective. Thus, the Quizizz application is an effective learning evaluation media in the set and logic course.

3.2 Analysis of Student Quiz Results Using the Quizizz Application

Students took quizzes using the Quizizz application, and their quiz results are listed in Table 2.

Table 1. Student Response Data Using the Quizizz Application

Very Well Response	Good Response
16	12

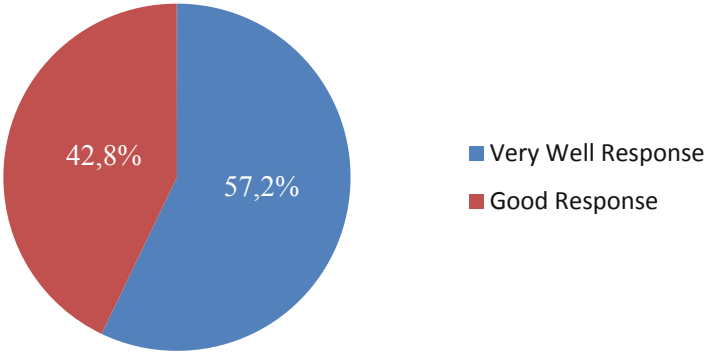

Fig. 1. Pie Diagram of Student Response Data Using the Quizizz Application

Table 2. Student Quiz Results Using the Quizizz Application

Range	Frequency	Percentage	Description
X ≥ 75	26	92,8	Complete
X < 75	2	7,2	Not Complete
Summary	28	100	-

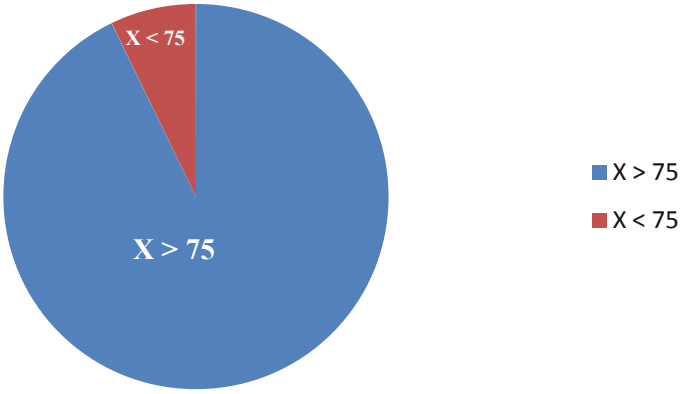

Fig. 2. Pie Diagram of Student Quiz Results Using the Quizizz Application

Table 2 shows that 26 students get a complete score (equivalent to category B), while two students still attain a score below the standard of completeness (category C). It showed that the student's relatively excellent learning outcomes were attained using the Quizizz application as a learning evaluation media. It indicated that the application is effective to be used in the learning process.

Figure 2 shows that 92.8% of students passed or completed the test. Meanwhile, 7.2% of students still got scores below the standard of completeness. This data found

affirmed the positive effects of the Quizizz application on student learning outcomes. Based on the effectiveness criteria stated by Arifki [18], if the student learning outcomes data is obtained >75%, then the media used in learning is effective. The data analysis of student learning outcomes showed that the Quizizz application could be effectively used as a learning evaluation media in the set and logic course.

3.3 Discussion

Our data analysis results showed that the Quizizz application could be effectively used as a learning evaluation media, as illustrated in Fig. 1. The data showed that 57.2% of students had an excellent response to the use of the Quizizz application. In comparison, 42.8% stated a good response. It signifies that students had a positive response to using the Quizizz application as a learning evaluation media. Based on the effectiveness criteria, it could be concluded that the Quizizz application can be effectively used as a learning evaluation media.

This student response is strongly influenced by the characteristics of the Quizizz application. Quizizz offers numerous features, such as being attractive, colorful, easy to access, and easy to use, so students favor this application to be used as a learning evaluation media. Besides, the use of this application also increases student motivation to focus on participating in learning activities, as shown by the students' answers to the questionnaire.

The results of this study are in line with research conducted by Nurhayati [19], Afiani, and Faradita [20] discovering that the Quizizz application can increase student activity during the online learning process, improve student learning outcomes, help students to be more thorough and calm in working on questions or quizzes, and train students to have good time management. Solikah [21] also stated that the Quizizz application has a positive and significant influence on learning outcomes and student motivation.

Data on student learning outcomes also stated similar results. From the 28 students who took the quiz using the Quizizz application, 26 students got a complete score. It means that 92.8% of students passed the Set and Logic courses. Based on the effectiveness criteria, it could be concluded that the Quizizz application can be effectively used as a learning evaluation media.

This high student learning mastery is influenced by the use of the Quizizz application as a learning evaluation media. Based on the questionnaire results, the Quizizz application increases students' focus on participating in learning. Consequently, it improves student learning outcomes, as shown by the high quiz completeness attained in this study.

The Quizizz application is attractive, easy to use, does not require expensive costs, and can be used anywhere and anytime. Thus, this application is attractive to students. Quizizz application unknowingly transforms educational tasks into games so that students are happier and enjoy every step of the learning process. The features in the Quizizz application, such as the timer and trophy feature, increase student motivation in learning.

The ranking system in the Quizizz application also motivates students to be the best. As a result, students strive to be the best in the competition [22] and study harder to complete quizzes correctly and quickly. Besides, the Quizizz application also improves students' focus on participating in learning since it has a timer feature. Students also learn to manage time to solve problems with the correct answers without rushing. In

addition, it makes students focus on the questions they are working on, reducing the chance of cheating or cooperating with their friends.

A similar argument was also stated by Anggraini et al. [23], that the use of Quizizz for third-grade students of Elementary School improves students' interest in the learning process, fosters a sense of enthusiasm for students in doing questions, and widens learning resources. Zhao [24] also explained that the use of Quizzzz in the classroom makes evaluation activities more fun, helps students review the subject, and stimulates their interest in learning. Likewise, Nugroho et al. [25] and Mei's research [26] found that Quizizz positively impacts the learning process in the classroom, with higher scores and better collaboration between students in groups.

From the discussion above, the Quizizz application can be effectively used as a learning evaluation media. This effectiveness impacts students' rate of quiz completion. Also, through this application, students will be more trained to use the internet as a medium for learning. It indirectly prepares students to face the era of smart society 5.0, which requires them to be responsive and intelligent in using various technologies.

4 Conclusion

Based on the research and data analysis results, we concluded that (1) student responses after using the Quizizz application were 57.2% for the excellent category and 42.8% for the excellent category. (2) The average student learning outcomes after using the Quizizz application were above 75. These results indicated that the Quiziziz application is an effective learning evaluation media in the set and logic course.

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