

Comparison of the Effectiveness of Google Form and Quizizz on Pancasila Education Learning Outcomes in Elementary School

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Abstract

This study aims to compare the effectiveness of Google Form and Quizizz as digital evaluation media in enhancing learning outcomes and student engagement in Pancasila Education. The background of this research lies in the limited variety of evaluation tools commonly used in schools, which often reduces student motivation and participation during assessments. The research employed Classroom Action Research using the Kemmis and McTaggart model, conducted in two cycles involving students of class X.G at State Senior High School 2 Malang. Each cycle comprised four stages: planning, implementation, observation, and reflection. Data were collected through learning outcome tests, student response questionnaires, and engagement observation sheets, and analyzed descriptively, both quantitatively and qualitatively. The findings indicate that Quizizz was more effective than Google Form in improving both learning outcomes and engagement. The average student score increased from 72.5 in the first cycle to 82.1 in the second cycle, while the number of students achieving mastery rose from 18 to 26. Furthermore, student engagement improved significantly, as reflected in positive responses toward Quizizz's gamification features such as leaderboards, instant feedback, and interactive quiz formats. Despite these positive outcomes, the study is limited to one class and two research cycles; therefore, future studies with a broader scope are recommended to validate the consistency and generalizability of the findings.

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Introduction

The development of information and communication technology (ICT) has had a major impact in various areas of life, including the education sector. The digitalization of education today includes not only the teaching and learning process, but also the transformation in the learning evaluation system. According to UNESCO (2023), the use of digital technology plays an important role in supporting inclusive, flexible, and effective learning, especially in distance learning situations. One form of digital adaptation in the world of education is the use of online-based evaluation media, such as Google Form and Quizizz, which allow teachers to carry out evaluations efficiently, flexibly, and accessible from various digital devices. This trend is also in line with the OECD report (2021) which emphasizes that digital platforms are able to increase student motivation and participation in interactive evaluation-based learning.

In Indonesia, the implementation of Pancasila Education learning has a strategic role in shaping the character of students as responsible, tolerant, and upholding national values. In practice, the active involvement of students is an important factor to ensure that learning is not only cognitive, but also touches on affective and psychomotor aspects. Unfortunately, based on the results of a survey conducted by the Education Assessment Center (Puspendik) of the Ministry of Education and Culture (2022), there are still many schools that apply conventional evaluation methods that tend to be monotonous and less interactive. This condition has an impact on students' low motivation to take part in the evaluation, which ultimately affects the achievement of their learning outcomes.

Initial observations in class X.G State Senior High School 2 Malang show that the implementation of the evaluation of Pancasila Education learning is still dominated by conventional methods using paper. The teacher checks the results of the evaluation manually, so it takes a long time and students cannot immediately know the learning results. In addition, student participation in participating in the evaluation is relatively low, characterized by a lack of enthusiasm when working on the questions. This is in line with the findings of Wibowo (2016) who stated that learning is said to be of quality if the majority of students are actively involved physically, mentally, and socially in the learning process. Therefore, a digital-based evaluation media is needed that is able to encourage optimal student involvement.

Several previous studies have shown the effectiveness of digital-based evaluation media in improving learning outcomes and student engagement. Amelia and Wardani (2020) stated that the use of Quizizz in science learning evaluation was able to increase student motivation by 27%. Hidayati and Nugroho (2020) also proved that Quizizz is effective in improving the learning outcomes of elementary school students through interactive gamification features. On the other hand, research by Septianingsih and Wulandari (2021) shows that Google Forms are superior in terms of time efficiency and ease of recapitulation of values, but are less able to create a pleasant evaluation atmosphere. However, there have not been many studies that directly compare the effectiveness of Google Form and Quizizz in learning Pancasila Education at the high school level.

Based on the literature study, it can be concluded that although each media has advantages, research that directly compares the effectiveness of Google Form and Quizizz, especially in the context of learning Pancasila Education at the high school level, is still limited. Most of the research focuses more on exact subjects or elementary and junior high levels.

Therefore, this research is important to answer these gaps, as well as assess which evaluation media is more effective in improving learning outcomes and student involvement in the context of civic education in Indonesia (Dewi, 2018).

This research is expected to make a theoretical contribution in enriching the study of the effectiveness of gamification-based evaluation media in citizenship learning. Practically, the results of this study can be a reference for teachers in choosing evaluation media that is in accordance with the characteristics of students and learning needs. In addition, for schools, this research can be an input in the development of effective and fun digital-based learning innovations. According to Majid (2014), the use of creative and interactive evaluation media is one of the key factors in creating a meaningful learning atmosphere and increasing student learning motivation.

Based on this description, the purpose of this study is to compare the effectiveness of the use of Google Form and Quizizz in improving learning outcomes and student involvement in learning Pancasila Education in class X of State Senior High School 2 Malang. This study also aims to analyze which media is more effective in increasing student learning motivation through a digital-based evaluation process.

This article consists of several parts, namely an introduction that contains the background, problem formulation, and research objectives; a method section that outlines the research design, participants, instruments, and data analysis techniques; results and discussions that present research findings and interpretation; and the final part in the form of conclusions and recommendations based on the results of the research.

Method

This research is a class action research (PTK) carried out in class X.G State Senior High School 2 Malang in the odd semester of the 2024/2025 school year with the subjects of all students of class X.G totaling 30 people. The learning material used is "Positions, Duties, and Responsibilities of Citizens" according to the Learning Outcomes phase E in the Independent Curriculum. The design of this study refers to the PTK Kemmis and McTaggart model which consists of the stages of planning, implementation of actions, observation, and reflection, which are carried out in two cycles. Data collection techniques include learning outcome tests in the form of multiple-choice questions, questionnaires of students' responses to digital evaluation media, observation sheets of students' activeness during evaluation, and documentation of learning activities. The validation of the instrument was carried out through expert judgement by two civics education lecturers and one senior teacher, with the results of the validity value of the instrument being above 0.80 which indicates a very valid category, while the reliability of the test instruments and questionnaires was tested using the Alpha Cronbach test with a coefficient value above 0.70. The data obtained was analyzed in a quantitative descriptive manner to calculate the average score, percentage of completeness, and improvement in learning outcomes between cycles, while qualitative data was analyzed through the stages of data reduction by simplifying and sorting the data from observations, questionnaires, and documentation, presenting data in the form of tables, graphs, or narrative descriptions, as well as drawing conclusions and verifying data to ensure the validity and reliability of research

results. Reflection on the implementation of actions is carried out after each cycle to evaluate the results and determine improvement in the next cycle.

Results and Discussion

Results

This research was conducted through two cycles with the aim of comparing the effectiveness of two digital evaluation media, namely Google Form and Quizizz, in learning Pancasila Education, especially in the material "Positions, Duties, and Responsibilities of Citizens." Each cycle follows the stages of planning, implementation, observation, and reflection, and is carried out in class X.G State Senior High School 2 Malang with a total of 32 students.

In the first cycle, the evaluation medium used was Google Form. The selection of this media is based on its practicality in creating questions, ease of distribution, and automation features in recapitulation of values. The teacher compiles questions in the form of multiple choice and short fills, then distributes them online to all students after the learning process is completed. Students were given 30 minutes to complete the evaluation individually, and the process went smoothly without any significant technical problems. Based on the recapitulation of scores, the average student score reached 72.5. Of the 32 students, as many as 18 students or 56.25% managed to achieve scores above the Minimum Completeness Criteria (KKM) set, while the rest have not been completed. The results of the questionnaire and observations showed that as many as 60% of students stated that the questions given were quite easy to understand, and 70% of students considered Google Form as an easy-to-use medium. However, there are 40% of students who admit that they are less motivated because the display of the questions is considered monotonous and not interactive, so it is necessary to innovate in the presentation of evaluations to be more interesting and able to increase student motivation in participating in evaluation activities.

Based on quantitative data and observational findings, it is known that Google Forms, although technically effective, are less able to attract attention and increase student motivation. Their enthusiasm when working on the questions is relatively low, and the atmosphere of the class tends to be passive. This is the basis for consideration for making changes to the evaluation media in the next cycle, in the hope of improving learning outcomes and engagement.

To increase the effectiveness of evaluation, in the second cycle, teachers use Quizizz as an evaluation medium. Quizizz is a game-based interactive evaluation platform (gamification) that allows students to participate in quizzes in a competitive yet fun atmosphere. Features such as leaderboards, background music, live feedback, and avatars are advantages that are expected to increase student engagement and motivation. Evaluation is carried out after the delivery of material using active methods and discussions. Students work on the Quizizz quiz within the allotted time, and the evaluation process takes place in a more lively, enthusiastic atmosphere. The results of the evaluation showed that the average student score increased to 82.1, or an increase of 9.6 points compared to the first cycle. In addition, the number of students who achieved completeness also increased to 26 out of 32 students or 81.25%, indicating a significant increase in the achievement of learning outcomes. The results of the questionnaire and observations also corroborate this finding, where as many as 90% of students feel more

enthusiastic and motivated when working on questions using Quizizz. As many as 85% of students stated that they liked the leaderboard feature which sparked the spirit of competition between friends, while 88% of students felt that the quiz format helped them to think faster, focus, and feel more challenged in solving the questions given.

The results of cycle II showed that the use of Quizizz significantly improved both learning outcomes and student involvement in learning evaluation. The classroom atmosphere became more lively, students showed enthusiastic expressions, and there was a more active interaction between teachers and students. In addition, teachers are also easier to monitor results because Quizizz provides real-time score data and can be downloaded for further analysis.

Table 1. Cycle I and II Comparison Table

Component	Cycle I (Google Form)	Cycle II (Quizizz)
Average score	72,5	82,1
Number of students completed	18 students	26 students
Student engagement (questionnaire)	60–70%	85–90%
Student response to the media	Less attractive	Engaging & interactive

Table 1.2 presents comparative data between the results of learning evaluation in Cycle I using Google Form and Cycle II using Quizizz based on several important components, namely: average score, number of students completed, level of student involvement based on questionnaires, and student responses to the evaluation media used.

In terms of average scores, there was a significant increase from 72.5 in cycle I to 82.1 in cycle II. This shows that the use of Quizizz as an evaluation medium has a positive impact on the achievement of student learning outcomes. Quizizz, with its interactive features, is able to create more fun evaluation conditions and does not burden students psychologically, so they can work on the questions more focused and optimally.

The number of students who achieved learning completeness also increased, from 18 students (56.25%) in the first cycle to 26 students (81.25%) in the second cycle. This increase reinforces the finding that evaluation media that is designed more attractively and in accordance with the characteristics of digital native students will have an impact on their success in understanding the material.

From the aspect of student involvement measured through questionnaires, the comparison shows an increase from the range of 60–70% in cycle I to 85–90% in cycle II. This means that more students feel actively engaged when using Quizizz than when using Google Forms. The gamification features in Quizizz, such as attractive visuals, a scoring system, and a competitive leaderboard, are able to encourage students to participate fully and enthusiastically in the evaluation process.

Meanwhile, students' responses to the evaluation media also showed striking differences. When using Google Forms, students find the medium less attractive, because it looks simple and tends to be monotonous. On the other hand, Quizizz is considered interesting and interactive, providing an evaluation experience that not only assesses concept understanding but also creates a fun and challenging learning atmosphere.

Overall, the data in this table confirms that Quizizz is superior to Google Form in supporting the learning evaluation process. Quizizz not only improves learning outcomes, but also has a positive impact on student motivation, engagement, and satisfaction. This is proof that the proper use of digital media can contribute greatly to the success of learning, especially in Pancasila Education subjects that require an understanding of values and active participation of students.

Conclusion Meanwhile, based on the results of the two cycles that have been implemented, Quizizz has proven to be more effective than Google Form in improving the results of Pancasila Education learning evaluation. Not only does it create a more enjoyable learning atmosphere, but it also succeeds in significantly increasing student motivation, engagement, and learning outcomes.

Discussion

The results showed a significant improvement in both learning outcomes and student engagement after the use of gamification-based evaluation media, namely Quizizz, compared to the use of Google Forms. Quantitative data shows a spike in the average score of students from 72.5 in the first cycle to 82.1 in the second cycle, with the number of students who reach the KKM also increasing significantly. In addition, qualitative data from the questionnaire showed an increase in student interest, motivation, and participation during the evaluation process.

These findings reinforce the results of previous research as stated by Wulandari (2022), that the use of Quizizz as an evaluation medium can create a more fun and competitive learning atmosphere, which ultimately has an impact on increasing students' motivation to learn. The game atmosphere provided by Quizizz, such as leaderboards, instant feedback, funny avatars, and interactive music, makes students feel interested in continuing to be actively involved in learning. Hartono (2021) also emphasized that although Google Form excels in terms of technical efficiency and ease of data analysis, this platform tends to be less able to arouse the spirit of learning due to its simple appearance and minimal interaction.

In the context of formative evaluation, the use of Quizizz provides significant added value. Evaluation is no longer seen only as an activity measuring cognitive achievement, but also as an integral part of learning itself. With direct feedback, students can immediately find out which answers are right or wrong, so that the process of reflection and learning improvement can take place more quickly and meaningfully. Teachers can also immediately identify students' difficulties and adjust the next learning strategy responsively.

Furthermore, students' intrinsic motivation also appears to increase during the use of Quizizz. Many students feel challenged to get the highest scores, compete healthily, and stay focused during the evaluation. The emotional involvement of students becomes more intense, as they feel they have an active role and are personally involved in the learning process. This is in contrast to Google Forms, which tend to make students work on questions passively and monotonely, without strong emotional motivation.

In addition, the use of Quizizz also encourages the emergence of a collaborative spirit in the form of informal discussions between students after the quiz ends. Some students shared their experiences answering questions, discussing questions that were considered difficult, and encouraging each other in pursuing rankings. This shows that learning through interactive digital media also has the potential to foster social values such as cooperation and communication.

From a teacher's perspective, Quizizz is a tool that is not only practical, but also strategic. Teachers can easily access the results, monitor the statistics of the questions, identify the most incorrect questions, and evaluate the effectiveness of the material and methods that have been delivered. This supports the principle of assessment as learning which places evaluation as an integral part of the student's thinking and learning process.

By considering the data obtained, it can be concluded that the selection of evaluation media not only has an impact on technical efficiency, but also greatly affects the quality of students' learning experience. Evaluation media such as Quizizz provides added value in the form of emotional involvement, increased motivation, and the creation of a conducive learning atmosphere.

As an implication, teachers need to consider several important things when choosing digital evaluation media. First, the characteristics of students, including learning styles, motivation levels, and ability to use digital technology, must be the main concern so that the media chosen is in accordance with the needs and abilities of students. Second, the purpose of the evaluation also needs to be clarified, whether it is solely to measure learning outcomes or at the same time to build an interactive and fun learning experience. Third, the availability of infrastructure such as adequate internet connections and technological devices that can be accessed by all students is a determining factor in the success of the implementation of digital evaluations in the school environment.

With the right approach, evaluation media is not only an assessment tool, but also a bridge to liberate students' learning potential. Quizizz, in this case, can be an example of a digital evaluation media that can help teachers transform evaluation into a fun, meaningful, and direct impact on the learning process.

In addition to motivational and cognitive aspects, the use of Quizizz also has a positive impact on learning time management. Because the evaluation process is carried out digitally and automatically, teachers no longer need to manually correct student results one by one. This is especially helpful in a class with a large number of students. Teachers can more quickly analyze the evaluation data, design learning follow-ups, and utilize time for individual mentoring for students who have not completed their studies. Time that would normally be taken up for a recap of grades can now be diverted to more meaningful pedagogical activities.

On the other hand, the application of digital media in the evaluation also introduces students to 21st century skills, such as digital literacy, quick decision-making, and critical thinking. When working on quizzes through platforms like Quizizz, students are required to read the questions carefully, choose answers in a limited amount of time, and understand the feedback given. This activity indirectly trains precision and efficiency of thinking. In the long

term, the integration of technology in learning and evaluation is one of the real efforts in equipping students with relevant skills to face global challenges in the future.

Table 2. Comparison of Evaluation Results

Aspects	Cycle I (Google Form)	Cycle II (Quizizz)
Average score	72,5	82,1
Students complete	18 students	26 students
Student enthusiasm	Keep	Tall
Positive response	60%	90%

Based on Table 2.2, there is a significant difference between the results of the evaluation in cycle I using Google Form and cycle II using Quizizz. The average student score in the first cycle reached 72.5, while in the second cycle it increased to 82.1. This increase shows an increase in students' cognitive abilities after the implementation of more interactive and fun evaluation media.

In terms of the number of students who have completed, there has been an increase from 18 students in the first cycle to 26 students in the second cycle. This shows that most students experience positive development in understanding the material after the evaluation is conducted using Quizizz. This means that the use of gamification-based evaluation media is able to help more students to achieve the set competency standards.

The level of enthusiasm of students has also undergone a marked change. During the evaluation with Google Form, the students' enthusiasm was moderate, where most students completed the evaluation without showing much interest. This is different with Quizizz, which manages to encourage high enthusiasm through a competitive and interactive evaluation atmosphere. This can be seen from the more enthusiastic expressions of students, as well as increased engagement during the quiz.

Meanwhile, students' positive responses to evaluation media have also increased significantly. In cycle I, only about 60% of students gave a positive response to Google Forms, while in cycle II, a positive response increased to 90% to Quizizz. This increase shows that students feel more comfortable and motivated when taking evaluations designed with engaging features such as leaderboards, points, and live feedback.

Thus, the data in the table emphasizes that Quizizz is more effective than Google Form in improving student learning outcomes, active participation, and motivation. This emphasizes the importance of selecting evaluation media that is not only practical from the teacher's side, but also fun and stimulates student involvement. From the table, it can be concluded that the use of Quizizz as an evaluation medium is more effective than Google Form in improving student learning outcomes and motivation.

Conclusion

Based on the results of class action research carried out in two cycles, it can be concluded that the use of gamification-based digital evaluation media, especially Quizizz, significantly supports the improvement of learning outcomes and student involvement in learning Pancasila Education in the material "Positions, Duties, and Responsibilities of Citizens" in class X of SMA

Negeri 2 Malang. The results of this study strengthen the action hypothesis that the application of interactive evaluation media is able to create a more participatory, fun learning atmosphere, and encourage students' learning motivation and academic achievement. In addition, this research makes a theoretical contribution in strengthening the gamification approach as an effective and practical formative evaluation strategy in the context of civic education at the high school level. As an implication, teachers need to consider several things when choosing digital evaluation media, such as the characteristics of students, the purpose of the evaluation, and the availability of supporting infrastructure such as internet connections and adequate technological devices, so that the implementation of the evaluation runs optimally and evenly. However, the findings of this study are contextual because they were only conducted in one class and two cycles of PTK, so it is recommended to conduct further research with the coverage of other subjects, different education levels, or a wider number of subjects to test the consistency, effectiveness, and influence of gamification-based evaluation media on various aspects of student learning outcomes more comprehensively.

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Authors' Note

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

References

- Adnan, G., & Latief, M. A. (2020). Effectiveness of the use of Quizizz media on students' learning interest. *Futurity: International Journal of Educational Research*, 1(1), 14-23. <https://doi.org/10.57125/fed.2024.06.25.13>
- Aqib, M., & Muslimah, K. C. (2020). Evaluation of Arabic learning outcomes using Google Form during school quarantine due to COVID-19 pandemic. *Journal of Islamic Thought and Education*, 4(1), 45-60. <https://doi.org/10.5430/ijhe.v8n1p37>
- Aula, Y., & Asrori, M. (2024). The effectiveness of using Quizizz in improving learners' motivation and engagement in learning. *Sebatik: Journal on Education in Resources, Environment and Technology*, 28(2), 152-163. <https://doi.org/10.46984/sebatik.v28i2.2526>
- Barus, M., Sinambela, H., & Siregar, E. (2021). The effectiveness of internet-based learning evaluation using Google Form during the COVID-19 pandemic. *European Journal of*

-
- Humanities and Educational Advancements, 2(7), 31-35. Retrieved from <https://www.neliti.com/id/publications/382110/>
- Chaiyo, Y., & Nokham, R. (2017). The effect of Kahoot, Quizizz and Google Forms on students' perception in the classroom response system. *Journal of Innovations in Teaching and Learning*, 1(1), 29-35. <https://doi.org/10.12691/jitl-1-1-6>
- Dahlya, S. D. N., Wahyuni, S., & Nasution, S. A. (2023). The effectiveness of Quizizz application as a learning evaluation instrument towards Society 5.0 era. In *Proceedings of the International Conference on Education 2022* (pp. 195-203). Atlantis Press. https://doi.org/10.2991/978-2-38476-020-6_20
- Dewi, R. (2018). Gamification in education: An alternative to technology-based learning strategies. *Journal of Education and Culture*, 23(1), 1-12. <https://doi.org/10.24832/jpnk.v23i1.961>
- Hidayati, N., & Nugroho, A. (2020). The application of Quizizz media to improve the learning outcomes of elementary school students. *Journal of Basic Education*, 11(2), 113-120. <https://doi.org/10.21831/jpd.v11i2.34479>
- Lim, J. N. H. (2024). Quizizz as technology to enhance EFL students' active participation in the classroom. *Journal of Knowledge Learning and Science Technology*. Retrieved from <https://www.academia.edu/103544040/>
- Malik, N. S., Tomar, N., & Chaudhary, O. (2019). Online quiz application. *International Journal of Advanced Research and Development*, 1(1).
- Muliati, A. T. (2023). The effectiveness of Quizizz application as a learning evaluation instrument in mathematics education. *Journal of Elementary Education and E-Learning*, 2(4), 45-52. <https://doi.org/10.26858/joeele.v2i4.54369>
- Narpila, S. D., Wahyuni, D., Elfina, H., & Nasution, S. A. (2023). The effectiveness of Quizizz application as a learning evaluation instrument towards Society 5.0 era. *ICE 2022 Proceedings*, (pp. 195-203). Atlantis Press. https://doi.org/10.2991/978-2-38476-020-6_20
- Nurbaiti, P. W., et al. (2018). Using Quizizz to integrate fun multiplayer activity in the accounting classroom. *International Journal of Higher Education*, 8(1), 37-46. <https://doi.org/10.5430/ijhe.v8n1p37>
- Oktaviani, R. (2022). Development of Google Form-based learning outcome evaluation instruments for animal development courses. *Jurnal Pelita Pendidikan*, 11(4), 294-300. <https://doi.org/10.24114/jpp.v11i4.54943>
- Simanullang, N. T., Sipahutar, H., & Kudding, H. (2022). The application of learning model (Google and Google Form) based Android toward students' activities and research methodology learning outcomes. *Journal of Innovation in Educational and Cultural Research*, 3(3), 294-300. <https://doi.org/10.46843/jiecr.v3i3.95>
- Singh, N. M., & Han, N. (2020). Effects of Web 2.0 tools (Kahoot, Quizlet, Google Form) on formative assessment in online chemistry courses. *Journal of Science Learning*, 6(4). Retrieved from <https://ejournal.upi.edu/index.php/jslearning/article/view/203>
- Sulistiyawati, Y., Pradita, Y., & Cahyadi, A. (2025). The effectiveness of using Quizizz in improving learners' motivation and engagement in learning. *Sebatik*. <https://doi.org/10.46984/sebatik.v28i2.2526>
- Turmudi, D., & Muslimah, K. C. (2020). Google Forms as an EFL assessment tool: Positive features and challenges. *Journal of Career Development and Transition for Exceptional Individuals*. Retrieved from <https://ojs.fkip.ummetro.ac.id/index.php/english/article/view/3037/>
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- Wei, S., Hou, W., & Jiang, F. (2024). Big data-based evaluation of higher education: Model construction and practice path. *Frontiers of Digital Education*, 1, 171-177. <https://doi.org/10.1007/s44366-024-0006-y>
- Wiley, D., et al. (2014). Building teacher competency for digital content evaluation. *Computers & Education*, 82, 18-28. <https://doi.org/10.1016/j.compedu.2014.10.007>
- Yılmaz, S. S., & Yaşar, M. D. Y. (2023). Effects of Web 2.0 tools (Kahoot, Quizlet, Google Forms) on formative assessment in online chemistry courses. *Journal of Science Learning*, 6(4). Retrieved from <https://ejournal.upi.edu/index.php/jslearning/article/view/203>
- Zhai, L., & Lu, W. (2023). A scale development study for the evaluation of digital content. *International Journal of Technology in Education*, 8(2), 482-501. <https://doi.org/10.46328/ijte.1074>
- Zhai, L., & Lu, W. (2023). Digital tools for evaluation: Exploring the efficacy of Quizizz and Google Forms. *Education Sciences*, 14(11), 1181. <https://doi.org/10.3390/educsci14111181>
- Zhai, L., & Lu, W. (2023). Research on the connotation of digital empowerment classroom teaching evaluation. In *Proceedings of the 3rd International Conference on Internet Technology and Educational Informatization* (pp. 45-53). EAI. <https://doi.org/10.4108/eai.24-11-2023.2343687>
- Zhan, Y., & Liu, H. (2024). Big data-based evaluation of higher education. *Frontiers of Digital Education*, 1, 171-177. <https://doi.org/10.1007/s44366-024-0006-y>
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