DEVELOPMENT OF QUIZIZZ-BASED TEST QUESTIONS ON PRODUCTION COST CALCULATION MATERIAL

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This research was developed to help teachers conduct evaluations and make the evaluation process enjoyable. The purpose of the study is to determine the validity, practicality, and potential test of the student's learning outcomes. The research was carried out at SMK Bina Sriwijaya Indonesia. The research method is conducted using the Research and Development (R&D) method, which is combined with the Sugiyono development model. The research uses data-gathering techniques such as observation, lifting, and testing questions. The results of data analysis showed that the quizizz-based test on the production cost calculation material obtained a validity score of 87% from the material experts and 88% from the media experts categorized as "Very Valid", the practicality test had a percentage score of 89% with the category "very Practical", and the n-gain results proved that there was a significant difference after using the product. Furthermore, this research offers innovative and effective tools to improve the quality of education, support innovation and creativity, and improve equality of access to education. By continuously developing and researching the use of quizz, it can open up new opportunities to improve learning quality and better educational goals.

Keywords: *Test Questions, Evaluation, Quizizz, Production Costs*

A. INTRODUCTION

Education is a fundamental pillar in shaping the next generation of the nation that is qualified and competitive. More than just the transfer of knowledge, education is a holistic process that fosters skills, noble values, and noble character in students. Through an innovative and inspiring teaching and learning process, the young generation is prepared to become resilient, creative, and contribute to the progress of the nation. The process of teaching and learning activities is inseparable from the presence of teachers (Gunawan and Khunaifi 2018:7). Teachers are a fundamental pillar in the world of education, especially in formal education, without the role of teachers, the learning process will be difficult to carry out effectively and optimally. Teachers have a great responsibility in leading students to achieve educational goals. The position of teachers is very strategic in learning , because the success or failure of students in learning is very determined by the abilities and skills possessed by the educator himself.

Learning is a process of interaction between teachers, students, and subject matter (Nurdyansyah 2019:45). Teachers in this case act as facilitators and help students improve their learning abilities by providing facilities and an environment (Akhiruddin et al. 2019:12–13). This shows that teachers play an important role in the learning process to achieve learning goals. One of the goals of realizing good learning is to improve the learning process and conduct learning evaluations to find out how well students understand the subject topics they have studied previously (Nadya Putri Mtd et al. 2023).

Learning evaluation is very necessary to be able to measure how far students' thinking ability is in terms of knowledge and skills for the learning that has been carried out (Nurulshifa et al. 2014:404; Siddiq and Sawaluddin 2020). The evaluation can provide an overview of the level of material proficiency, an overview of the student's learning disability, and an overview of the student's position among his peers (Ina Magdalena et al. 2023:168). By conducting an evaluation, teachers can find out whether the learning system as a whole is

effective or not. The learning component consists of learning objectives, learning materials, methods, learning media, learning resources, learning environment atmosphere, and learning evaluation(Asrul, Ananda, and Rosnita 2014:12).

The purpose of evaluation is to improve the quality of learning, improve, and enrich students, and create a learning environment that is more in line with their achievements. Another goal is to improve, deepen, and expand education, and lastly, to provide parents and guardians of students with information about decisions about grade advancement and student graduation (Mahirah 2017:261).

Learning evaluation allows teachers to improve the quality of learning so that students can learn more actively, and education managers can be expected to further improve facilities and learning as a whole (Latif 2019:162). The success of a learning program is always measured through the acquisition of student learning outcomes, learning outcomes are a measure used to determine how well students master the material after the learning process is completed (Pratiwi and Januardi 2019:26).

There are two types of learning evaluation methods, namely, test techniques and non-test techniques (Irawan 2020:37). Test techniques are used to measure learning outcomes in the cognitive field (theoretical knowledge). While non-tests to measure learning outcomes in the affective and psychomotor fields (Hutapea 2019:152). If teachers can make the right learning evaluation instruments to be used in the evaluation process, then the learning evaluation process will run well.

Along with the development of the world of education, teachers are required to produce creative ideas so that the learning process can be more effective and interesting (Sujarwinanti, Ma'arufi, and Anshori 2020:34). With the continuous advancement of technology, today anyone can access everything they want to know without being limited by location or time (Gunawan et al. 2021:210).

In modern education, knowledge or cognitive assessments are not only carried out in print. Many educational institutions have used technology to support learning and assess student outcomes. Using online application-based technology in the evaluation process, such as using smartphones as a container for evaluation tools, will make evaluation tools more interesting, effective and practical, and teachers can more easily evaluate student learning outcomes (Seftiani 2019:285). The evaluation system can be said to be practical if it does not require a lot of equipment and is easy to use (Febriani, Elvia, and Handayani 2021:192). With an evaluation system like this, a teacher can immediately give feedback to his students.

Based on the results of observations and interviews conducted by researchers with business economics teachers at SMK Bina Sriwijaya Indonesia, it is known that the evaluation method used during the evaluation process still uses the Papper Best Test (PBT) where for daily tests in business economics subjects usually use the type of essay questions. From the results of these observations, it shows that the evaluation tools used are not interactive and conventional. As a result, students set an example, the classroom atmosphere became crowded, and students did not immediately collect answers when the time given ran out. In addition, the assessment process takes a long time because it needs to be thorough when checking student answer sheets. Therefore, an evaluation tool is needed that can help evaluation activities become more practical, fast and accurate.

One of the applications that can be used as an alternative evaluation tool is the quizizz application (Zaeni 2022:198). Quoted from Purba, quizizz is an interactive online learning platform that uses dynamic and engaging gamification where teachers can create and manage quizzes, surveys, and interactive lessons with various learning styles (Purba 2019:33). Quizizz is an application that allows students to work on practice questions through their smartphones or computers. The app also motivates students to keep learning, which means they can improve their learning outcomes (Setiawan, Wigati, and Sulistyaningsih 2019:169).

The use of the Quizizz application for evaluation is expected to improve the quality of learning evaluation, increase student motivation, and make the class more fun. Adequate infrastructure and facilities, such as the availability of internet networks, are essential for the use of this technology. This application is quite effective to be used as a test tool, with speed and accuracy scores can provide challenges to students in working on questions seriously (Setiawan et al. 2019:167).

Quizizz-based evaluation tools have many advantages, such as being easy to use and fun for students of various levels of education, effective in reducing human error when checking student test results, questions and answer choices can be randomized quickly so as to reduce cheating in exams, time allocation set according to plan. The use of the quizizz application can make evaluation activities easier, because the results of online tests that have been done by students are automatically recapped and can be downloaded and displayed in pdf, so that the assessment process will be much more practical and effective (Nugroho et al. 2019:3).

From the description of these problems and phenomena, the researcher is interested in conducting a development research entitled "Development of Quizizz-Based Test Questions on Production Cost Calculation Material". The development of this product offers innovative solutions to improve the quality of learning evaluation and support more effective and engaging learning for students in the digital era, as well as making it easier for teachers to evaluate faster and more accurately. The purpose of this study focuses on: How to develop quizizz-based test questions on production cost calculation materials that are tested for validity, practicality, and potential effects on student learning outcomes?

B. RESEARCH METHODS

This type of research is research and development or Research and Development (R&D), RnD is a methodology that focuses on creating new products or improving existing products. In the context of education, R&D aims to develop a variety of learning products that are effective and beneficial to students(Sa'adah and Wahyu 2020:12). The development research model used is the Sugiyono development model, while the flow of the research stages with the Sugiyono model is shown in figure 1.
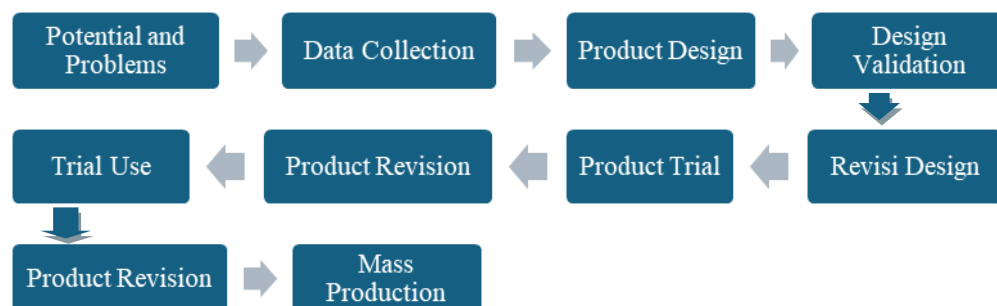
Figure 1. Flow of Sugiyono's Development Model Stages
Source: (Sugiyono 2019:298)

The subjects of this study are class X students majoring in Marketing with 9 students and Accounting with 15 students. This research uses data collection techniques, namely: observation, interviews, tests, and questionnaires. To test the validity of the product, two experts are needed, namely material experts and media experts, and for the practicality test is filled by students. The product validity assessment instrument is made in the form of a questionnaire, where the score will be analyzed using the Likert scale, while the practicality assessment will be analyzed using the Guttman scale. The results of

the validity test data and product practicality test will be processed using the formula explained by Purwanto (Purwanto 2020:102):

$$NP = \frac{R}{SM} \times 100\%$$

Keterangan:
NP = Percent value sought
R   = Score obtained
SM   = Maximum score

Based on the validity score criteria, the product can be said to be valid if the results of the expert test obtain a score of > 71% with a valid or very valid category. As for practicality, the product can be said to be practical if the results of the student questionnaire get a score of > 61% with the practical or very practical category (Akbar 2017:82).

In this study, to see whether the product has effectiveness or not, a comparison is made between the pretest value and the posttest value. To determine the increase in student learning outcomes, it was obtained using the n-gain formula. The normalized-gain formula is as follows:

$$\text{N-gain (g)} = \frac{X_2 - X_1}{X_{makz} - X_1}$$

Keterangan :
X_1 = Pretest scores
X_2 = Posttest value
X_{maks} = Maximum value

Based on the gain score criteria according to Meltzer & David, the product can be said to be effective if the test results of the student get an n-gain score of > 0.3 with medium or high criteria.

C. RESULTS AND DISCUSSION

The results of the research entitled Development of Quizizz-Based Test Questions on Production Cost Calculation Materials have been carried out in accordance with the stages of the Sugiyono model. The results of observations and interviews with subject teachers show that the use of PBT makes students not collect answers immediately after the time given is up. On the other hand, the use of PBT makes it take longer for teachers to correct students' answer sheets individually.

Data or information collection related to quizizz-based test questions to support the evaluation process. Data collection by analyzing learning materials and analyzing the assessment system. The test question material selected to be used as a test question in this development is the production cost calculation material contained in the business economics subject. The material used is a difficult material so it requires a strong understanding and memory so that the material is absorbed properly.

This quizizz-based test question is designed to meet the needs of evacuation in accordance with the curriculum and syllabus of SMK Bina Sriwijaya Indonesia. Before that, the product must go through a validity test stage in order to be used. Validity testing is an important step in the research and development process of measuring instruments. By conducting validity tests, researchers and developers can ensure that the resulting measurement tools will be valid and produce reliable data for decision-making or conclusion making.

This assessment is carried out by material and media expert validators. Quizizz-based test questions are validated twice by experts, in the first validation the product still needs to

be improved according to the comments and suggestions given by experts. After getting a decent or valid score, the product can be tested at the next stage. The results of the validity test analysis by experts can be seen in the diagrams in figures 2 and 3.
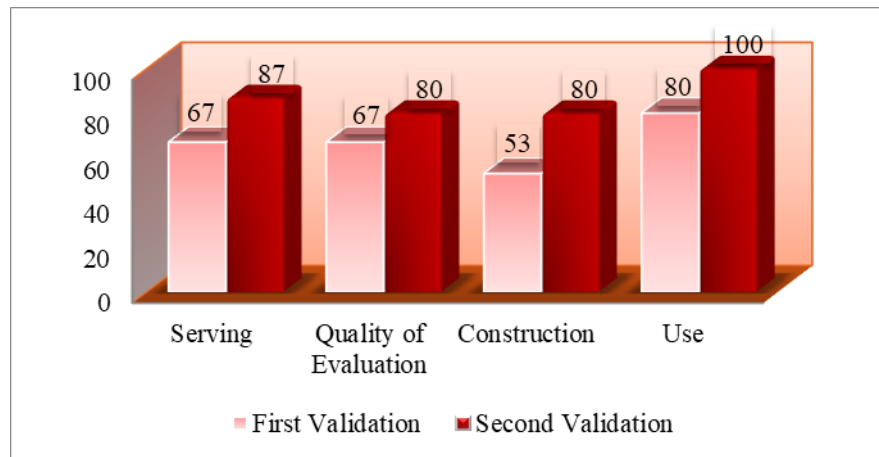
Figure 2. Material Expert Validation Diagram

Based on the results of the data processing calculation from the first validation questionnaire by material experts, it can be seen that the construction aspect gets the lowest final result, which is 53%, the indicators contained in the construction are the suitability of the questions with the students' abilities, the level of difficulty of the questions in the question items, the discriminating power of the question items. If viewed from the validity category according to Akbar, the interval level reaches the interval level of >41% - 55% which is included in the category of "less valid" (Akbar 2017:78).

After being improved and re-validated by material experts, it can be seen based on Figure 2 that the use aspect gets the highest final result, which is 100%, while the indicators of the use aspect, namely the effectiveness of the evaluation tool, and the practicality of the use of the evaluation tool. If the total average result of all aspects of assessment is calculated, then the final result is 87%, If the results of interpretation validation are based on the criteria of Akbar's categorization, the validation of the material reaches an achievement level between >86% and 100%. including interval interpretation criteria from with the category "Very Valid" (Akbar 2017:78).
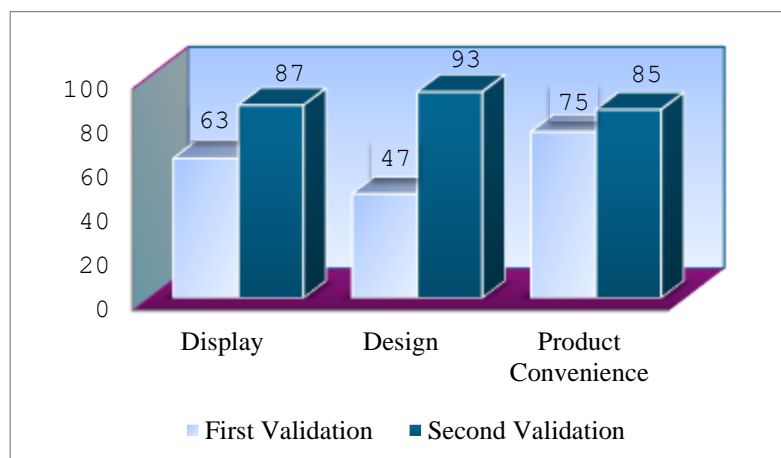
**Figure 3. Media Expert Validation Diagram**

Based on the results of data processing calculations from the first validation questionnaire of media experts, it can be seen that the design aspect gets the lowest final result, which is 47%, the indicators contained in the design, namely the use of letters in the evaluation tool, the suitability of images or tables in the question items, and the clarity of writing in the question items. If viewed from the category of practicality according to Akbar, the interval level reaches the interval level of >41% - 60% which is included in the category of "quite practical" but still needs to be improved.

After the second improvement and validation by media experts, it can be seen based on the figure 3 aspects of use have significant changes compared to the previous score, which is 93%. If the total average result of all aspects of the assessment is calculated, then the final result is 88%, if the results of the interpretation validation are based on the criteria of the categorization of Akbar, the media validation achieves an achievement level between >81% - 100%, including the interval interpretation criteria with the category of "Very Practical" and is worthy of testing.

Before
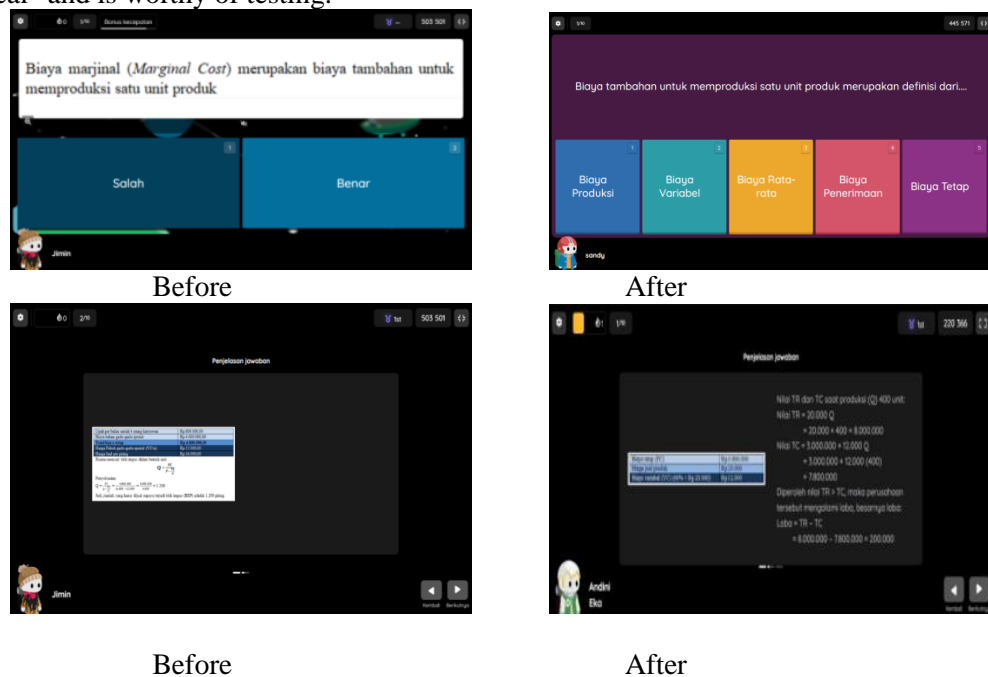
After

Before

After

Figure 4. Product Display Before and After Revision

After conducting a validation test, from material experts and media experts so that the product has been said to be valid and suitable for testing to students, the next stage is the practicality test. The practicality test is an important step in the research and development process of products or learning aids. The practicality test is used to determine the level of practicality of a product, whether the product is easy to use. practical, effective, and provides benefits for its users. The subject at this stage is the selected grade X student majoring in marketing representing academic abilities in the low, medium, and high categories. The practicality test was analyzed based on a questionnaire filled out by students, the results of the analysis can be seen in figure 5.
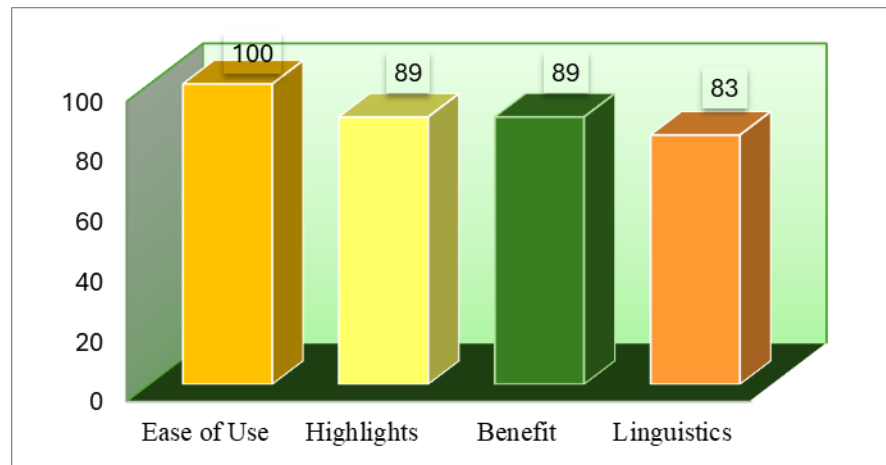
Figure 5. Practicality Test Diagram

From the student response questionnaire, the average score obtained was reviewed from the indicator of ease of use, which is 100% with very good criteria. This shows that the instructions for using quizizz-based test questions can be easily understood and used by students. Based on the results of the practicality test data processing using the Purwanto calculation formula, the average score of the practicality test questions based on quizizz is 89%, if the results of the interpretation validation are based on Akbar's categorization criteria, the validation of the material reaches an achievement level between >81% - 100% (Akbar 2017:82), then the score is included in the interval interpretation criteria from the category "Very Practical".

Furthermore, an effectiveness test was carried out on quizizz-based test questions on production cost calculation materials. The effectiveness test can be analyzed based on the results of the pretest and posttest data that have been done by the students. After obtaining data on the initial and final knowledge values, the minimum completeness analysis (KKM) was carried out, which was 75. The data of the student completeness score diagram for the pretest and posttest is presented in figure 6.
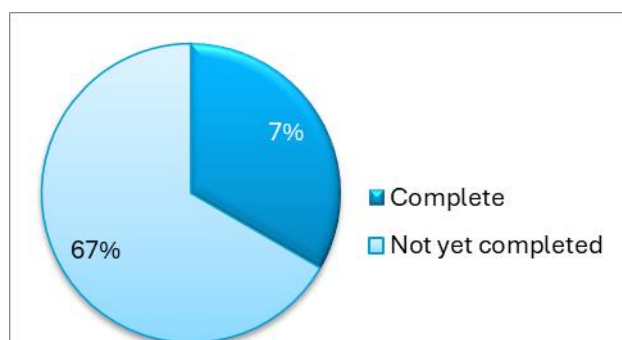

(A) Student Pretest
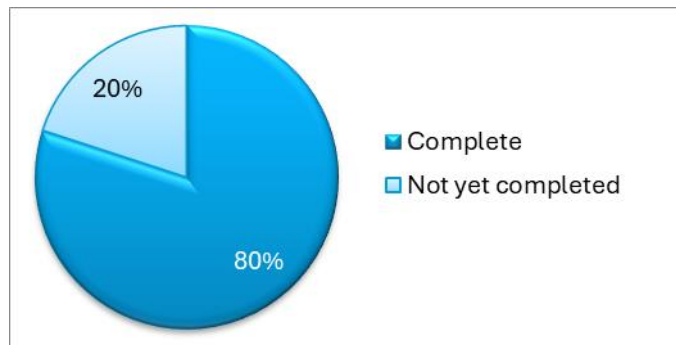
(B) Student Posttest
Figure 6. Student Completion Diagram

Based on the data in figure 6, there is a significant difference in the number of student completions in the pretest and posttest. The results showed that the number of students who did not complete it dropped to 20% after using quizizz-based exam questions with production cost calculation materials. Furthermore, to be able to find out the improvement of student learning outcomes, the data will be processed using the n-gain calculation.

In this study, a normality test was carried out using the lilliefors test with the help of the Microsoft Excel 2007 program, then the value was obtained l_{hitung} for the pretest is 0.137 and the posttest is 0,152. If viewed based on l_{tabel} value distribution l_{tabel} significance of 5%, then it is obtained as 0.220, it can be concluded that the data of pretest and posttest scores are normally distributed because it has a value of $l_{hitung} < l_{tabel}$. Next is to analyze the n-gain test, the results of the n-gain analysis based on the student's criteria can be seen in figure 7.
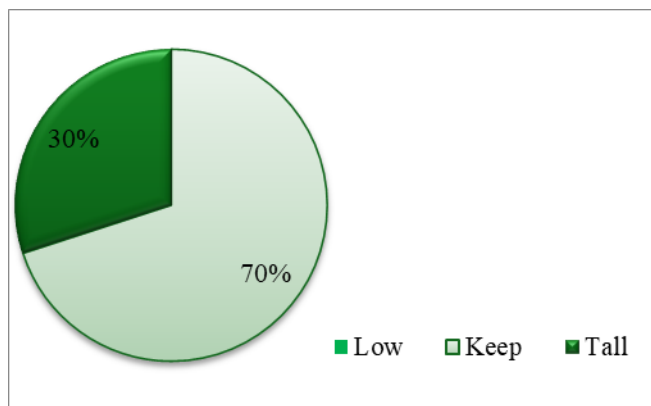
Figure 7. N-Gain Criteria Diagram

Based on the results of the n-gain data processing using the normalized-gain formula, the final score of the quizizz-based test question is 0.61, and if the n-gain results are interpreted using the categorization criteria Meltzer & David has a score of >0.3, and the score is included in the moderate criteria. From the data collected, it can be concluded that quizizz-based test questions have a potential effect to improve student learning outcomes.

D. CONCLUSION

The results of the study show that quizizz-based test questions obtained a final percentage of validity tests by material experts of 87% from media experts of 88%, so that the test questions are included in the "Very Valid" category. In addition, the practicality test

obtained a final percentage of 89%, which is included in the "Very Practical" category. And based on the results of the pretest and posttest that were carried out, a significant difference can be seen after using quizizz-based test questions, and from the calculation of n-gain obtained a final result of 0.61 which is included in the medium category, this shows that the product has a potential effect to improve student learning outcomes.

The implementation of evaluation using quizizz is very good to apply to students, because in addition to adding to the learning experience, it can also make students not bored in participating in business economics learning, and also the test results can be downloaded in the form of pdf files so that it can make it easier for teachers to correct the results of the evaluation. Quizizz can also be used to conduct Mid-Semester Assessments (PTS) from home and Final Semester Exams (UAS) remotely. With the development of quizizz-based test questions, it is hoped that it can bring various benefits to the world of education, especially for teachers to be able to take advantage of technology-based facilities in the learning process, especially in evaluation activities at school, and for students so that evaluation activities run in a fun and interactive way.

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