Inovasi Kurikulum *- p-ISSN 1829-6750 & e-ISSN 2798-1363*
Volume 21 No 3 (2024) 1345-1358

Inovasi Kurikulum
https://ejournal.upi.edu/index.php/JIK

HOTS-Based e-evaluation Quizwhizzer in science learning in elementary schools

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ABSTRACT

Teachers have'nt implemented HOTS-based questions for learning evaluation, resulting in students' low thinking abilities. This research aims to develop HOTS-based E-evaluation using the Quizwhizzer application. This research uses the ADDIE model with various stages, namely (1) the analysis stage, curriculum analysis, student character, and learning evaluation are carried out; (2) the design stage, learning materials are determined, HOTS questions and research instruments are prepared; (3) the development stage, validation of the suitability of the material, language and media is carried out; (4) the implementation stage, a validation test of the practicality and effectiveness of the application is carried out; (5) the final, evaluation stage was carried out to find out deficiencies in the application. The research subjects were 28 class IV students at SDN Mulyorejo 3. The instruments used are tests and questionnaire sheets. The research results showed that the E-Evaluation of the feasibility test was 90 percent from material experts, 96 percent from language experts, and 92 percent from media experts. The results of teacher practicality were 95 percent, students were 92 percent and effectiveness showed that there was an increase in students' HOTS abilities." HOTS-based e-evaluation using the quizwhizzer application can increase students' HOTS in science learning.

ARTICLE INFO

Article History:
Received: 2 Apr 2024
Revised: 13 Jun 2024
Accepted: 15 Jun 2024
Available online: 21 Jun 2024
Publish: 30 Aug 2024

Keyword:
e-evaluation; higher order thinking skill; Quizwhizzer

Open access
Inovasi Kurikulum is a peer-reviewed open-access journal.

ABSTRAK

Guru belum menerapkan soal-soal berbasis HOTS untuk evaluasi pembelajaran sehingga berakibat kemampuan berpikir peserta didik yang rendah. Tujuan penelitian ini untuk mengembangkan E-evaluation berbasis HOTS menggunakan aplikasi Quizwhizzer*. Penelitian ini menggunakan model ADDIE dengan berbagai tahapan yaitu (1) tahap analyis dilakukan analisis kurikulum, karakter peserta didik, dan evaluasi pembelajaran; (2) tahap design dilakukan penentuan materi pembelajan, menyusun soal HOTS dan instrument penelitian; (3) tahap development dilakukan validasi kelayakan materi, bahasa, dan media; (4) tahap implementation dilakukan uji validasi kepraktisan dan keefektifan aplikasi; (5) terakhir, tahap evaluation dilakukan untuk mengetahui kekurangan pada aplikasi. Subyek penelitian ialah peserta didik kelas IV SDN Mulyorejo 3 sejumlah 28 peserta didik. Instrumen yang digunakan yakni test dan lembar angket. Hasil penelitian menunjukkan E-Evaluation dari uji kelayakan sebesar 90 persen dari ahli materi, 96 persen dari ahli bahasa, dan 92 persen dari ahli media. Hasil kepraktisan guru 95 persen, peserta didik 92 persen dan keefektifan yang menunjukkan terdapat peningkatan kemampuan HOTS peserta didik. E-evaluation berbasis HOTS menggunakan aplikasi* Quizwhizzer *dapat meningkatkan HOTS peserta didik pada pembelajaran IPA.*

Kata Kunci: *e-evaluation; kemampuan berpikir tingkat tinggi;* Quizwhizzer

How to cite (APA 7)
Kumala, F. N., Safitri, I., Triwahyudianto, T., Yasa, A. D., & Salimi, M. (2024). HOTS-Based e-evaluation Quizwhizzer in science learning in elementary schools. *Inovasi Kurikulum, 21*(3), 1345-1358.

Peer review
This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

https://doi.org/10.17509/jik.v21i3.71147

INTRODUCTION

Many teachers have not implemented evaluation tools that focus on High Order Thinking Skills (HOTS). Furthermore, most evaluation questions still use tools that assess Low Order Thinking Skills (LOTS). Additionally, there are limitations in using conventional evaluation methods in the classroom, leading to academic dishonesty among students during evaluations, and many students submitting their answer sheets after the given time limit. There is also a potential for errors in correcting and assessing students' learning outcomes. Furthermore, students have not yet utilized electronic evaluation tools in the form of games. Evaluation tools facilitate learning evaluation by providing information on improving students' skills (Narassati et al., 2021). In science learning, especially in elementary school, the process tends to be monotonous and passive because some students do not fully understand the material presented, as they only follow the learning process based on the teacher's instructions, relying on textbooks and images. One of the topics in science learning for fourth-grade elementary students is Energy Transformation. It is known that energy is the effort or ability used to make something happen. Therefore, simple experiments can be conducted to help students understand this material better to prove energy changes. To support the effectiveness of the learning process, digital learning media can also be used to engage students' enthusiasm for learning.

Based on the problems mentioned, one solution can be addressed through HOTS-based e-evaluation. HOTS-based evaluation is an evaluation method that measures cognitive abilities at an advanced level. These abilities include: 1) synthesizing concepts with factual knowledge; 2) analyzing and utilizing information; 3) developing problem-solving strategies; and 4) critically examining ideas and information (Aprilia, 2020). HOTS refers to the capacity to communicate effectively, analyze, understand, and provide innovative solutions. The need to improve students' quality, such as critical and creative thinking, can now be achieved through the development of evaluation using HOTS questions. These abilities are related to critical thinking, reflective thinking, metacognition, and creativity. Stimuli are commonly used when creating HOTS questions (Putri & Dwijayanti, 2021). The stimulus serves as a foundation for formulating questions. In the context of HOTS (Higher Order Thinking Skills), the stimuli provided are contextual and engaging (Setyowati et al., 2023). When creating HOTS-based questions, teachers must possess the expertise and skills required to formulate questions and select appropriate stimuli depending on the specific situation and context, as well as a comprehensive understanding of the teaching topic (Fanani, 2018). Evaluation activities demonstrate the teacher’s capacity to analyze and understand the relationship between knowledge and materials while showcasing their ability to address practical challenges from various perspectives. Integrating HOTS into the learning evaluation system will enhance students' creative thinking (Azhar & Pasandaran, 2022).

In assessing the effectiveness of the teaching and learning process, teachers need to develop evaluation methods that specifically focus on learning objectives. These evaluation tools should be based on HOTS and aligned with the professional goals of educators facing the challenge of optimizing technology development and utilizing it in learning (Susanto & Ismaya, 2022; Setyaningrum et al., 2020). Research shows that using creative and interactive learning media can improve students' learning outcomes, foster creative thinking skills, and facilitate the application of acquired knowledge (Ali, 2023; Putra & Salsabila, 2021). Using technology in the evaluation process will make it more engaging and efficient, and it can help educators assess students' learning outcomes. Effective learning is learning that optimally utilizes information and communication technology as a tool (Latip, 2020). Thus, it can be concluded that using technology-based evaluation tools can reduce dishonest behavior among students, such as cheating, ensuring that the evaluation results truly reflect the students' thinking.

In today's digital era, conventional learning can transform into modern learning due to educational technology (Tambak & Lubis, 2022). The rapid advancement of technology has led to various online

https://doi.org/10.17509/jik.v21i3.71147

learning applications that can be utilized to facilitate the evaluation of Higher Order Thinking Skills (HOTS) in education. One such tool is the Quizwhizzer application. This tool enhances students' focus on learning material and simplifies the evaluation process by generating scores and rankings automatically after completing the quiz. The advantages of Quizwhizzer in research show its potential to increase the learning interest of fourth-grade students in studying energy sources and boost motivation and learning outcomes in Civics Education and eighth-grade material on the digestive system (Oktavian et al., 2023). Based on the interactive game media, Quizwhizzer has proven to be a highly suitable tool for evaluation (Audina et al., 2022).

The above research shows that there is a similarity in the use of the Quizwhizzer application as a learning evaluation tool. However, previous researchers have not studied HOTS-based evaluation questions in a quiz format. Therefore, the researcher will develop a HOTS-based e-evaluation using the Quizwhizzer application. In this context, it is important to develop a HOTS-based e-evaluation using the Quizwhizzer application, as this will allow the evaluation of creative thinking skills and expose students to higher-order thinking through HOTS-based evaluation questions. Ultimately, this will improve the overall quality of education (Annisa et al., 2023). This research aims to describe the development process and determine the feasibility, practicality, and effectiveness of HOTS-based e-evaluation using the Quizwhizzer Application on the Energy Transformation Material for Grade IV Elementary School. The HOTS-based e-evaluation using the Quizwhizzer application on energy transformation material for Grade IV is expected to be an attractive and enjoyable evaluation tool for students. This product is expected to contribute to introducing advanced, engaging, and fun evaluation tools in educational institutions. Furthermore, this product is expected to function as a valuable and practical evaluation tool in schools, simplifying the process of assessing student learning outcomes for teachers. Additionally, students will be free to answer quiz questions in the classroom and at any location and time.

LITERATURE REVIEW

Learning Evaluation

Evaluation is an important instrument in learning (Idrus, 2019). Evaluation is a systematic and continuous tool to assess learning outcomes and determine how effective the teaching process is, serving as feedback for improving future lessons (Putri & Dwijayanti, 2021). Evaluation is conducted to ensure that the quality of students, learning outcomes, and teaching methods are improved appropriately (Sari et al., 2017). Evaluation determines the extent to which learning objectives have been achieved and identifies students' academic success level (Magdalena, 2023). The development of evaluation aligns with the use of technology, namely electronic evaluation (e-evaluation), which is created through various software applications of different types and functions (Umam et al., 2017). It can be said that evaluation results from the learning interaction between teachers and students that influence changes in students' actions, including knowledge, attitudes, and skills.

Higher Order Thinking Skills (HOTS)

HOTS is described as the ability of students to understand, analyze, and modify previous information so that it is not monotonous (Karimah, 2018). HOTS is a process of thinking comprehensively and step by step to find solutions to problems (Rahayu et al., 2020). Brookhart defines HOTS as moving from problems to solutions through critical thinking (Rochman & Hartoyo, 2018). Other studies also mention that HOTS is the ability to think critically, using broad reasoning, enabling students to find new ways creatively, make wise decisions, and apply them in solving problems based on scientific knowledge and to critique something based on logical and scientific foundations (Ulum, 2020). HOTS can be trained by providing

https://doi.org/10.17509/jik.v21i3.71147

exercises that focus on higher-order cognitive skills or level C4 (analyzing), which means the ability to break down concepts into parts and link them so that the overall concept is understood, C5 (evaluating), which shows the ability to assess solutions and ideas for effectiveness, and C6 (creating), which means the ability to design a way to solve problems (Jannah & Pahlevi, 2020). It is essential to equip children with advanced cognitive skills to effectively address everyday challenges (Setyaningrum et al., 2020). The main goal of HOTS is to enhance students' higher-order cognitive thinking skills, particularly their capacity to analyze complex learning materials and effectively solve their problems (Azam & Rokhimawan, 2020; Zamkakay, 2022).

Quizwhizzer

Quizwhizzer is an educational game application that offers a narrative and easily adaptable experience, with various features for creating questions. Users only need to access the quiz code to start (Faijah et al., 2021; Wahyuningsih & Darodjat, 2021). Quizwhizzer is an engaging evaluation tool that offers several benefits in the learning process. It is accessible for free and provides a variety of attractive templates (Vinidiansyah et al., 2021). Quizwhizzer is an application designed to facilitate educators and students in carrying out learning evaluation activities (Susanto & Ismaya, 2022).

METHODS

This study uses a Research and Development (R&D) method to produce a product and test its feasibility. This study uses the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). The choice of the ADDIE model is based on the consideration that this model is easy to apply, easy to understand, and is a systematic development model. In **Figure 1**, it can be seen that the process of creating a HOTS-based e-evaluation product using the Quizwhizzer application includes various stages, namely: 1) the analysis stage, which involves analyzing the curriculum, student characteristics, and learning evaluation; 2) the design stage, which involves determining the learning material, designing HOTS questions, and preparing research instruments; 3) the development stage, which involves validating the feasibility of the material, language, and media; 4) the implementation stage, which involves testing the practicality and effectiveness of the application; and 5) the final stage, evaluation, is conducted to identify any shortcomings in the application.

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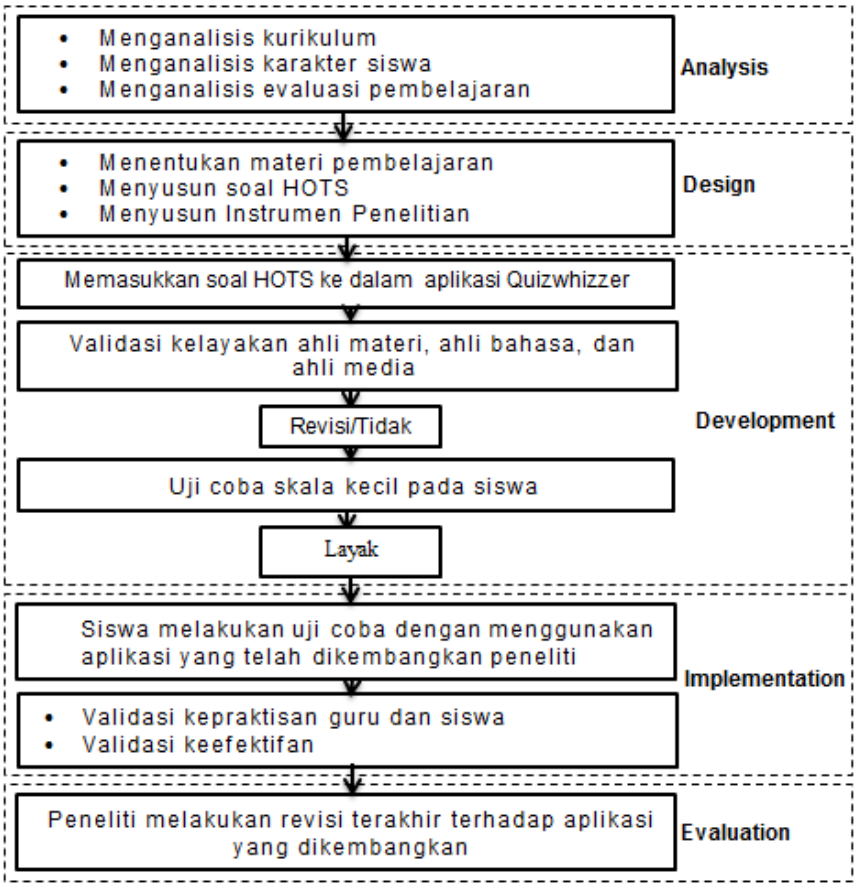

Figure 1. ADDIE Research and Development Model Procedure
Source: Research Documentation 2024

The subjects of this study are the fourth-grade students of SDN Mulyorejo 3, totaling 28 students, who will use Chromebooks for the trial of the HOTS-based e-evaluation product using the Quizwhizzer application. The data used consists of qualitative data from expert validations and feedback and suggestions from teachers and students regarding the practicality aspect. In addition, quantitative data is obtained from assessment results, specifically scores given by subject matter experts, media experts, and language experts. Data collection methods include surveys and evaluations based on expert input to assess the feasibility or validity of the evaluation tool developed by the author. Additionally, this is used to measure the practicality of the evaluation tool based on feedback from teachers and students. This study uses questionnaires and test sheets as its instruments. Below is the outline of the validation instruments by subject matter experts, media experts, and language experts (see **Table 1**).

Table 1. Outline of Expert Validation Instruments

Validation	Aspects Evaluated	Evaluation Indicators
Subject Matter Expert	Questions	Appropriateness of the questions with Competency Standards (CP), Basic Competency (TP), and Achievement Competencies (ATP)
		Appropriateness of question items with the material
		Appropriateness of images and videos with the material
		Appropriateness of answer choices with the material
		Use of stimuli and distractors in the questions
		Appropriateness of question items with student abilities
	Construction	Clarity of the text
		Answer choices are written sequentially.
		Complete question identity

https://doi.org/10.17509/jik.v21i3.71147

Validation	Aspects Evaluated	Evaluation Indicators
		Instructions are easy to understand
Media Expert	Effectiveness of features in the Quizwhizzer application for creating questions	Effectiveness of features in the Quizwhizzer application for creating questions
		The Quizwhizzer application feature can be used to check scores.
	The presentation is easy to read.	Text in the application is easy to understand
		Text and font size are easy to read.
		Images and videos in the questions are clear.
	Efficiency Ease of Use	The Quizwhizzer application is easy and efficient to use for creating evaluation questions.
		The Quizwhizzer application can train students' higher-order thinking skills.
Language Validator	Clarity	Accuracy and effectiveness of sentence elements
	Dialogic and interactive	Correctness of terminology
		The message delivery is understandable.
		Understanding of the message or audio
	Compliance with language norms	Accuracy of grammar and spelling used
	Appropriateness for students' development	Suitability for students' intellectual and emotional development
	Readability and sentence structure accuracy	Use of the standard Indonesian language
	Accuracy of grammar and spelling used	Use of the standard Indonesian language
		Sentences have no double meaning.

Source: Research Documentation 2024

After the data was obtained, the next step was data analysis. This study used a Likert scale analysis ranging from 1 to 4. A score of 1 indicates an inferior result, 2 indicates a poor result, 3 indicates a good result, and 4 indicates an excellent result. Furthermore, the results of the feasibility and practicality validation questionnaires were calculated using the following formula:

$$P = \frac{\sum x}{\sum xi} x100\%$$

Explanation :

P = Validation Presentation

$\sum x$ = Total score from validation (actual score)

$\sum xi$ = Maximum possible score

100 = Constant value

The decision to revise the HOTS-based e-evaluation using the Quizwhizzer application is based on the feedback from users and validators, including media experts, subject matter experts, language experts, teachers, and students. The validators' decisions are based on the validation criteria listed below (see **Table 2**).

Table 2.Validity and Practicality Criteria Percentage

Percentage	Criteria
85% - 100%	Very Good
76% - 84%	Good
60% - 75%	Poor
≤ 55% - 59%	Very Poor

Source: Modified by the author, 2024

https://doi.org/10.17509/jik.v21i3.71147

The effectiveness of HOTS-based e-evaluation using the Quizwhizzer application can be assessed by analyzing students' learning evaluation results after completing the HOTS-based e-evaluation developed through Quizwhizzer. This data can be explained by calculating the average using the following formula:

$$\text{Ideal Percentage} = \frac{Research\ Score}{Maximum\ Ideal\ Scorel} x100\%$$

Learning outcomes can be determined by applying the N-Gain Score method once the results are available.

$$\text{N-Gain} = \frac{Skor\ PostTest - Skor\ Pretest}{Skor\ Ideal - Skor\ Pretest}$$

Based on the classification shown below (see Table 3), learning outcomes are considered to have improved if the N-Gain score is greater than 0.3.

Table 3. Standard N-Gain Score Classification

N-Gain Score	Classification
G>0,7	High
0,35 > G > 0.7	Medium
G<0.3	Low

Source: Aisyah & Dewi (2021)

RESULT AND DISCUSSION

Firstly, in the analysis phase, it was found that the current learning evaluation activities still rely on conventional media, particularly paper-based methods. However, there are inherent drawbacks to using conventional evaluation tools. These include instances of students cheating during evaluations, delays in submitting answer sheets after the allocated processing time has ended, and the potential for errors in scoring and grading. Additionally, educators are not yet accustomed to using HOTS-based questions, which present a challenge for students when attempting to answer questions that provoke curiosity. Moreover, the results of the analysis indicate that students do not understand energy transformation. Therefore, developing a HOTS-based e-evaluation using the Quizwhizzer application serves as an engaging and user-friendly evaluation tool for students, helping them become more familiar with answering HOTS questions while enhancing their understanding of energy transformation.

Secondly, in the design phase, the previously prepared HOTS questions were packaged into an interactive quiz using the Quizwhizzer application. In **Figure 2**, the display of the Quizwhizzer application features an access code and a link to access the e-evaluation.

Figure 2. Quizwhizzer App View
Source: Research Documentation 2024

https://doi.org/10.17509/jik.v21i3.71147

Meanwhile, in **Figure 3**, the questions are designed in an engaging way, complemented with videos, making it easier for students to understand the meaning of the statements. In addition, the researcher has also prepared the instrument grid and expert validation sheets and created practicality questionnaires for teachers and students.

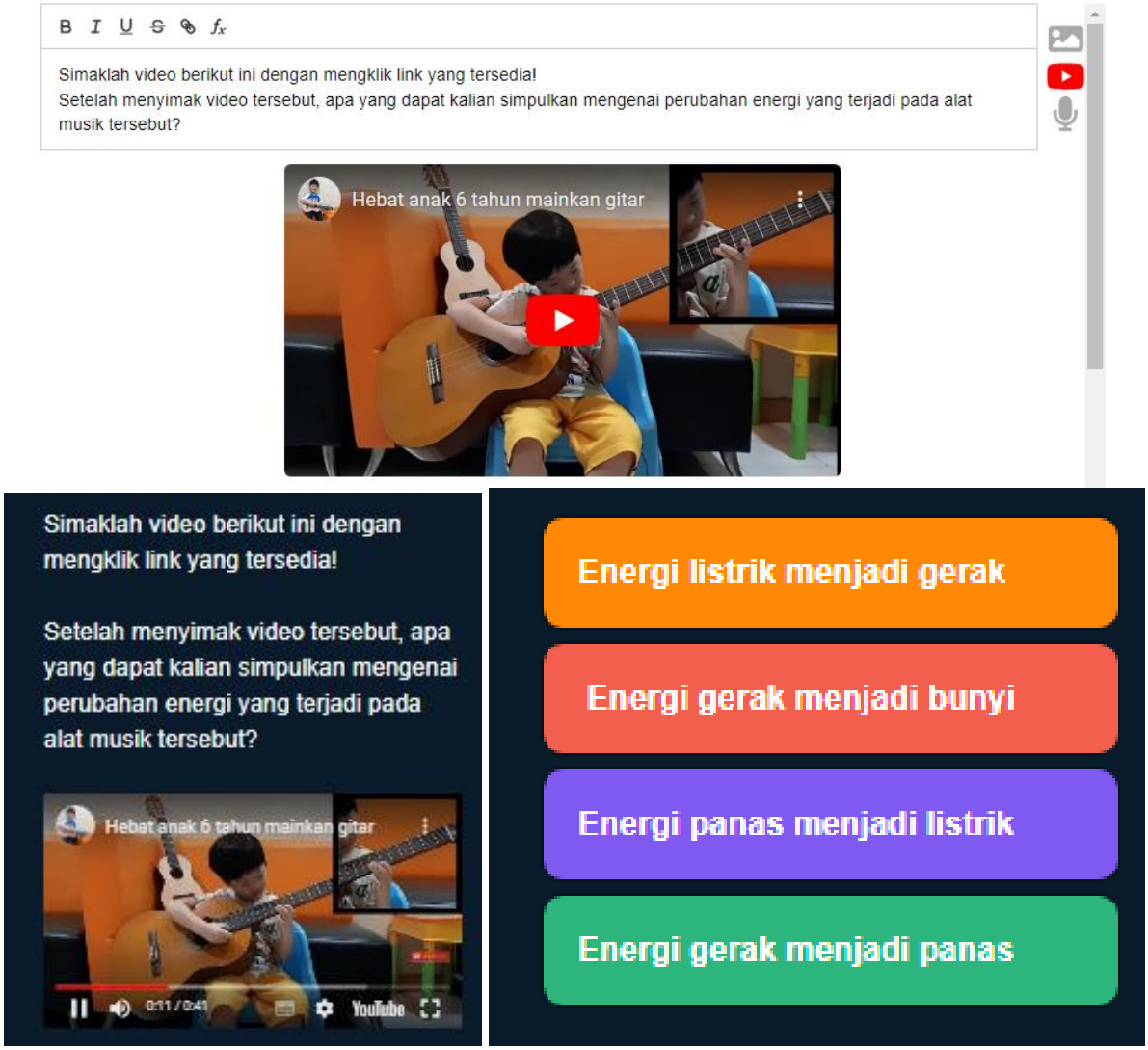

Figure 3. The process of packaging HOTS questions in the Quizwhizzer application
Source: Research Documentation 2024

Third, the development stage aims to produce an e-evaluation based on HOTS using the Quizwhizzer application, which has been revised based on expert feedback. The validators comprised three lecturers from the Faculty of Education, University of PGRI Kanjuruhan Malang. Based on the validation results, the content expert received a percentage score of 90%, which falls under the "Feasible" criteria. Then, the language expert's validation results indicated that the language used had a percentage score of 96%, with the "Very Feasible" criteria. Next, the media expert's evaluation showed a percentage score of 92%, falling under the "Feasible" criteria. After the data was obtained from the total average validity (RTV), the results of validating the e-evaluation based on HOTS using the Quizwhizzer application can be concluded based on the ideal conversion guide, as shown in Table 4.

https://doi.org/10.17509/jik.v21i3.71147

Table 4. Validator Evaluation on Feasibility Aspects

Validator	RTV	Interpretation
Content Expert	90%	Feasible, needs revision
Language Expert	96%	Very feasible, no revision needed
Media Expert	92%	Feasible, needs revision
Total Average	92,6%	

Source: Research Results 2024

Fourth, the implementation stage: At this stage, the product has been revised based on suggestions and feedback from experts. The researcher then conducted a small group trial with five students from grade IV of SDN Mulyorejo 3. The students were given the e-evaluation, which was deemed feasible by the expert validators, and the student practicality questionnaire showed a score of 91%, which falls under the "Very Practical" criterion. Subsequently, the researcher conducted a large group trial with 28 students from grade IV of SDN Mulyorejo 3. This trial or implementation was conducted to assess the practicality level of the HOTS-based e-evaluation using the developed Quizwhizzer application. The validation results for the practicality measurement for both teachers and students were collected using questionnaires. The results for these aspects are presented in **Table 5**.

Table 5. Validator Evaluation on Practicality Aspects

Aspects Evaluated	Percentage
Student practicality	92 %
Teacher practicality	95 %

Source: Research Results 2024

Based on **Table 5**, the practicality of the students was measured, resulting in a score of 92%, which falls under the "Very Practical" category. The teacher practicality questionnaire resulted in a score of 95%, indicating that the HOTS-based e-evaluation using the Quizwhizzer application is very practical for both students and teachers as a learning evaluation tool. This study also demonstrates the effectiveness of the HOTS-based e-evaluation through the Quizwhizzer application, as proven by analyzing pre-test and post-test data on Energy Transformation. The following data presents the learning achievement results of grade IV students from SDN Mulyorejo 3 in Malang City, both before and after using the Quizwhizzer application.

Table 6. Pretest and Post-test Results Using the Quizwhizzer Application

Pretest Score	Post-test Score	*N-gain*
62	87	0,68

Source: Research Results 2024

Based on Table 6, the students' learning outcomes after participating in the learning activities using the Quizwhizzer application on energy transformation showed a pre-test score of 62, while the average score for the post-test was 87. The students' pre-test scores were below standard. After completing the learning process through the Quizwhizzer application, there was an improvement in the students' learning outcomes, as evidenced by the post-test results. The improvement in learning outcomes can be measured using the N-gain, which resulted in a value of 0.68, falling into the "medium" range according to the criteria. Therefore, the Quizwhizzer application can be utilized for e-evaluation for grade IV students at SDN Mulyorejo 3.

Fifth, the evaluation stage is the process of evaluating the results of the trials that have been conducted. The results of the product trial evaluation showed that no further improvements were needed for the HOTS-

https://doi.org/10.17509/jik.v21i3.71147

based e-evaluation using the Quizwhizzer application because it was already in the "valid" status and categorized as "very practical" and "effective."

Discussion

The development process of HOTS-based e-evaluation using the Quizwhizzer application was conducted at SDN Mulyorejo 3 with a total of 28 students, and the researcher used 20 valid questions for the e-evaluation. Valid evaluation instruments can activate students' higher-order thinking skills (HOTS) (Afrita & Darussyamsu, 2020). Based on the results of the data analysis, the feasibility test results of HOTS-based e-evaluation using the Quizwhizzer application from the material expert were categorized as valid with a percentage score of 90%, falling under the "Valid" criterion. The developed product focuses on the material and uses effective sentences. The language expert evaluation received 96%, with the "Very Valid" criterion, as it covers the components of language used by the guidelines of good and correct Indonesian. Meanwhile, the media expert validator received a score of 92%, with the "Valid" criterion. Therefore, in terms of media, the development of the Quizwhizzer application as an evaluation tool for learning outcomes can be considered valid and suitable for use in learning. Overall, it has an average total validity (RTV) of 92.6%, categorized as "very valid." This result indicates that the HOTS-based e-evaluation using the Quizwhizzer application is valid and suitable for use in learning, as it meets the components and criteria of e-evaluation according to the characteristics of the students.

The advancing era of education 4.0, the need for HOTS (Higher Order Thinking Skills) is crucial. Integrating HOTS into student learning allows educators to foster advanced cognitive abilities, enabling students to effectively keep pace with the knowledge and technology continuously evolving in today's era. Therefore, educators can cultivate HOTS skills in students by getting them accustomed to HOTS exercises found in books. These tasks are designed to relate to everyday life and incorporate character values (Jaya, 2021). In this research, educators still use conventional media for learning evaluations and have not yet incorporated HOTS-based questions. As a result, the average student in this study demonstrated low-level thinking abilities. However, with the complete dedication and consistency of implementing HOTS-based e-evaluation using the Quizwhizzer application, students' thinking skills will be elevated to a higher level, particularly in science learning at SDN Mulyorejo 3. Therefore, using technology, such as e-evaluation, to build learning materials is key. This approach increases students' interest and fosters a conducive learning environment, enabling students to develop higher-order thinking skills due to the limited emphasis on critical thinking, analysis, and evaluation in their teacher training (Yasa et al., 2020).

The evaluation product was good based on the revisions and improvements made according to the feedback, criticism, and suggestions from the content, language, and media experts, as well as the results from the small-scale trial. Subsequently, a practicality questionnaire was administered to the fourth-grade teacher at SDN Mulyorejo 3 for the revised evaluation product. The practicality results from the teacher, who showed a score of 95%, categorized as "Very Practical." In comparison, the evaluation results from the students showed an average score of 92%, also categorized as "Very Practical." This indicates that students and the teacher could easily use the HOTS-based e-evaluation using the Quizwhizzer application as a learning evaluation tool in the fourth-grade class at SDN Mulyorejo 3. This is evidenced by the percentage on the questionnaire, which indicates that the Quizwhizzer evaluation was more engaging for the students and helped facilitate the learning evaluation process. Technology media will ease the communication process between the communicator (teacher) and the communicators (students) during the evaluation process, and the role of educators in designing innovative and creative learning media is essential to support student success (Rolisca & Achadiyah, 2014). Furthermore, it can create more engaging learning experiences. Thus, technological innovation significantly enhances the learning process, making it more effective and interactive.

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This study's results also demonstrate the product's effectiveness, evidenced by a significant increase in the average pre-test and post-test scores. The average pre-test score of the students was 62, while the average post-test score was 87. The improvement in learning outcomes can be calculated using the N-gain formula, resulting in a score of 0.68, which falls into the "medium" category. This improvement shows that the Quizwhizzer application is beneficial, as the HOTS-based questions boosted the students' thinking skills to a higher level, reflected in the improvement in their learning outcomes after using Quizwhizzer as a learning evaluation tool. This is further supported by other research, which states that there is a difference in the learning outcomes of students using the interactive Quizwhizzer media compared to those not in improving learning outcomes in science subjects (Faijah et al., 2021). The influence of Quizwhizzer media can also increase students' motivation and learning outcomes (Ekaputra, 2023; Oktavian et al., 2023).

CONCLUSION

Based on the previous explanation, the conclusion can be drawn that the development of HOTS-based e-evaluation using the Quizwhizzer application follows the ADDIE model with the stages of analysis, design, development, implementation, and evaluation. Based on the feasibility questionnaires, the HOTS-based e-evaluation product using the Quizwhizzer application was rated as feasible. The material expert validator achieved a feasibility score of 90%, the media expert validator scored 92% with a "very feasible" category, and the language expert validator scored 96% with the "very feasible" category. The practicality level shown in the practicality questionnaire for teachers was 95%, according to the "Very Practical" criteria. Similarly, the students reached a practicality level of 92% with the same criteria. The HOTS-based e-evaluation conducted through the Quizwhizzer application proved to be highly effective. This conclusion is based on students achieving an average score exceeding the KKTP (Kriteria Ketercapaian Tujuan Pembelajaran) of 87. Additionally, the analysis of student learning improvement using the N-gain calculation resulted in a score of 0.68, which falls within the "medium" category. The Quizwhizzer application can be used for HOTS-based e-evaluation on energy transformation in grade IV, thus providing an enjoyable evaluation tool for students. In advancing research, it is recommended to conduct research and development of HOTS-based e-evaluation using the Quizwhizzer application. This should not be limited to science and technology education or the transformation of energy material, but should include other subjects and learning fields.

AUTHOR'S NOTE

If any, thanks are addressed to official institutions or individuals who have provided funding or have made other contributions to the research. A research contract number accompanies acknowledgments.

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