



## Development of Interactive Media Based on *Quizizz paper Mode* in IPAS learning In Grade IV of Elementary School

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### ABSTRACT

This study aims to develop, validate, and evaluate the practicality and effectiveness of Quizizz Paper Mode as an interactive learning medium for fourth-grade Ilmu Pengetahuan Alam dan Sosial (IPAS) in elementary schools. The research employed the ADDIE model consisting of Analysis, Design, Development, Implementation, and Evaluation stages. Data were collected through observations, interviews, expert validation sheets, practicality questionnaires, and learning outcome assessments. The study was conducted in three elementary schools: SDN 07, SDN 02, and SDN 16 Sungai Aur. Validation results from media, material, and language experts produced an average score of 90%, categorizing the media as very valid. Practicality tests involving teachers and students indicated high usability with percentages ranging from 92.5% to 95%. Effectiveness was measured through pre-test and post-test results analyzed using the N-Gain formula, showing substantial improvements with N-Gain scores of 0.77, 0.80, and 0.89, all classified as high. The findings demonstrate that Quizizz Paper Mode is valid, practical, and effective in improving student engagement, motivation, and understanding in IPAS learning. It is recommended as an interactive learning tool to support meaningful learning experiences in elementary schools.

## 1. Introduction

Education is an important thing in human life because which aims to transfer knowledge while developing the potential of students as the main actors in learning activities (Zahara & Yulianty, 2024). Education is a conscious effort to pass on a cultural heritage from one generation to the next. Education serves as an example for the teachings of previous generations (Mardiansyah et al., 2023). One of the most influential innovations in education is the rise of information technology. This breakthrough has reshaped the way teaching and learning occur in schools, introducing new methods that were not possible before. Integrating technology into

education is thought to enhance the quality of learning while making the process more effective and efficient (Riyadi & Wibawa, 2024). Recent developments in educational technology have shown promising results, as demonstrated by Sudarno et al. (2025) who found that augmented reality learning media based on inquiry-based learning using Assemblr Edu effectively improved student understanding of light and properties material.

The use of information technology-based learning media makes learning activities more engaging and interactive (Dewi et al., 2021; Suarmita et al., 2026). The use of Quizizz Paper Mode as a formative assessment media has provided teachers and students with an interactive and accessible platform, making it easier to conduct assessments that meet students' needs, enhance engagement, and improve learning outcomes (Putri & Pujiawati, 2025). One application widely used in learning activities is Quizizz. Natural and Social Sciences (IPAS) learning in elementary schools has integrative characteristics that require students to actively engage in environmental exploration, critical thinking, and contextual problem-solving. According to Minister of Education and Culture Regulation No. 56/M/2022, ideally, IPAS learning should be student-centered, employing a scientific approach, and utilizing interactive learning media and technology. The importance of interactive learning media in elementary education has been emphasized by Munawarah (2025), who developed augmented reality-based learning media in science learning on plant body parts material for Grade IV of elementary school, demonstrating that technology-enhanced media can significantly improve student engagement and comprehension.

However, in reality, science learning still uses conventional methods such as lectures and written assignments, which tend to be boring for students (Failasufah & Setyasto, 2023). The learning process is one-way, with the teacher as the center of information and students merely as recipients of the material (Pratiwi & Tyas, 2025). Teachers report that limited media and learning variations make students appear passive, unenthusiastic, and often unfocused (Wulandari & Zulherman, 2024). This is reinforced by student statements that reveal that learning is only centered on Student Worksheets (LKS), without interactive media, resulting in students not being actively involved in the learning process and experiencing difficulties in understanding the theoretical and applied sciences material. During observations, it was seen that some students were not focused on paying attention, talking to themselves, or playing with writing tools while the teacher was explaining. The classroom atmosphere also tended to be passive, without discussions or collaborative activities, resulting in low student learning outcomes. This challenge of passive learning environments has been addressed in various studies, including research by Nuraini et al. (2025) who demonstrated that the guided inquiry learning model successfully improved students' critical thinking skills in fisheries subjects in Grade IV of elementary school, suggesting that active learning approaches are essential for meaningful science education.

According to Prasetyo & Setyawan (2020), active and interactive learning is essential for students to be directly involved in the thinking process, discussions, and evaluation of their learning outcomes. Wahyuni et al. (2024) echoed this

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sentiment, stating that interactive learning media can increase student motivation and concentration, as well as strengthen conceptual understanding. As a solution to the problems that occurred, an interactive learning media based on Quizizz Paper Mode was developed. This media allows students to take game-based quizzes by answering questions using barcoded paper, without having to rely on digital devices. According to Fauziah & Sofian (2023), the use of Quizizz Paper Mode can increase student participation and engagement in learning, because it combines elements of games, competition, and fun direct feedback. Furthermore, research by Khusnunnisa & Andriani (2025), in their study on the development of interactive multimedia assisted by augmented reality for human hearing sense material, shows that interactive learning media can effectively create an active learning atmosphere, increase student engagement, and enhance understanding through enjoyable and engaging activities. This aligns with the findings of the present study on Quizizz Paper Mode-based interactive media in IPAS learning for Grade IV students, where the media also fostered active participation, motivation, and improved learning outcomes. The effectiveness of multimedia learning tools has been further validated by Jannah et al. (2025), who found that augmented reality-based storybooks enhanced students' reading interest, demonstrating that interactive digital media can engage elementary students across various subject areas.

The use of Quizizz Paper Mode can be the right solution to overcome boredom in conventional learning methods (Mulyana & Rahma, 2024). With game and competition features, Quizizz Paper Mode makes learning more interesting and enjoyable (Cahyani & Putranto, 2024). Students who were previously less interested in science lessons began to show greater enthusiasm (Kurniawan et al., 2025). This interactive medium offers students the opportunity to actively engage in answering questions, fostering participation without relying heavily on electronic devices. By incorporating interactive elements similar to educational games, students are not only able to gain deeper understanding of mathematical concepts but also feel more involved and motivated in the learning process (Oktama et al., 2026). The integration of technology in science education has been shown to enhance learning across multiple dimensions, as evidenced by Yohana et al. (2025) who developed science e-modules based on ethnoscience for work, energy, and simple machine topics in junior high school, demonstrating improved student understanding and cultural relevance. Similarly, Septiani et al. (2025) reported that augmented reality integrated learning media on atomic theory development effectively improved learning outcomes of Phase E SMA/MA students, indicating the broad applicability of technology-enhanced learning materials across educational levels.

Previous research has consistently shown the positive impact of interactive learning media on student outcomes. Syahrir et al. (2025) developed learning modules based on augmented reality as a means of visualizing abstract concepts in IPAS theme "Knowing Our Earth," finding that AR-based modules helped students better understand complex scientific concepts through visual representation. These findings align with constructivist learning theory, which emphasizes that students construct knowledge through active engagement with learning materials and environments. Interactive media such as Quizizz Paper Mode facilitate this

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construction by providing immediate feedback, encouraging active participation, and making abstract concepts more concrete and accessible to young learners.

Despite the growing body of evidence supporting interactive learning media, gaps remain in understanding how specific platforms like Quizizz Paper Mode can be effectively implemented in Indonesian elementary schools, particularly for IPAS subjects. While Muti'ah et al. (2024) successfully developed fraction pop-up book augmented reality-based media to improve numeracy skills, demonstrating the effectiveness of interactive media in mathematics education, there is limited research on game-based assessment tools that combine digital and paper-based elements for integrated science learning at the elementary level. This study addresses this gap by developing, validating, and evaluating Quizizz Paper Mode as an innovative solution that bridges traditional and digital learning approaches.

The development of Quizizz Paper Mode based learning media is expected to tackle issues of low student engagement and subpar learning outcomes in science (Yuliana, 2024). This media goes beyond being just an alternative to traditional, monotonous methods; it acts as a bridge toward more ideal learning experiences that are technology driven, enjoyable, and student centered. The objectives of this study are to explore the development process of Quizizz Paper Mode media for grade IV science lessons in elementary schools, assess the validity of the media in enhancing science learning, evaluate its practicality in classroom implementation, and determine its effectiveness in improving learning outcomes for grade IV students. Through systematic development and rigorous evaluation, this research aims to contribute to the growing body of knowledge on interactive learning media and provide practical solutions for improving IPAS education in Indonesian elementary schools.

## **2. Methodology**

This study belongs to the category of Research and Development (R&D). R&D focuses on creating new innovations or improving existing ones. It is a systematic approach used to develop new products, methods, or processes through a series of studies and experiments (Sugiyono, 2018). The preliminary study stage involves collecting and gathering relevant information. In this stage, the researchers conducted observations and interviews at two schools: SDN 07 and SDN 02 Sungai Aur in West Pasaman Regency. The development model used in this study is the ADDIE model, which comprises five structured stages. Although simple in concept, the ADDIE model is highly systematic, and its flexibility allows modifications to create effective learning media based on Quizizz Paper Mode. The five stages of ADDIE development are: Analysis, Design, Development, Implementation, and Evaluation.

The validation instrument in this study consisted of a structured validation sheet designed to obtain accurate and systematic information regarding the feasibility and quality of the developed Quizizz Paper Mode learning media. This validation sheet was used by expert validators to assess various aspects of the media, including

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content suitability, media design, and language clarity, in order to determine whether the media met the required standards for use in learning activities. In addition, practicality instruments were employed to measure the ease of use and applicability of the Quizizz Paper Mode media in real classroom settings. The practicality data were collected through the implementation of the developed learning media, using two main instruments: a teacher response questionnaire and a student response questionnaire. These questionnaires were designed to capture users' perceptions related to clarity of instructions, attractiveness, ease of implementation, and usefulness of the media in supporting the learning process, thereby providing comprehensive information on the practicality of the developed learning media.

Observations were conducted through direct classroom observation to capture the learning process in a natural setting, focusing on the interactions between teachers and students during instructional activities. The researchers systematically observed and recorded students' responses to the learning materials, their levels of participation, attentiveness, and engagement, as well as patterns of interaction among students and between students and the teacher. In addition, classroom dynamics such as the learning atmosphere, student enthusiasm, and the flow of teaching activities were documented to provide a comprehensive picture of how the learning process occurred. These observations were carried out throughout the lesson to ensure that changes in student behavior and participation at different stages of learning could be accurately identified and analyzed.

Interviews were employed as a data collection technique through direct verbal question-and-answer interactions between the researcher and respondents to obtain in-depth information related to the implementation and use of the developed learning media. The collected data were then analyzed descriptively, particularly the validation data obtained from experts, to determine the level of validity of the media based on predetermined criteria. Practicality data were analyzed by calculating the percentage of responses from teachers and students, which reflected the ease of use, attractiveness, and suitability of the media in the learning process. Meanwhile, the effectiveness of the media was measured by analyzing students' learning outcomes through pre-test and post-test scores using the N-Gain Score formula proposed by Hake (1999). The N-Gain results were categorized into three levels, namely low ( $<0.3$ ), medium ( $0.3-0.7$ ), and high ( $>0.7$ ), to determine the extent of improvement in students' learning outcomes after the implementation of the learning media.

### **3. Results and Discussion**

#### ***Analysis of Learning Media Validity Test Results***

##### **a. Analysis of Material Expert Validation Test Results**

The validation of the learning material was carried out by a material expert, Yeni Erita, who serves as a lecturer in the Primary School Teacher Education program at PGSD FIP UNP. The validation process was conducted on July 24, 2025, using a

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structured validation sheet designed to evaluate the feasibility, relevance, accuracy, and suitability of the learning material with the fourth-grade IPAS curriculum. The results of the validation showed that the Quizizz Paper Mode-based learning media achieved a validity score of 90%, which falls into the “very valid” category. This high level of validity indicates that the content is well-aligned with learning objectives, conceptually accurate, and appropriate for students’ cognitive development. Furthermore, the validation results suggest that the media does not require major revisions and is feasible to be implemented directly in classroom learning activities, supporting its potential effectiveness in enhancing student understanding and engagement.

#### b. Analysis of Media Expert Validity Test Results

The results of the media validity test were obtained through expert evaluation conducted by Mrs. Dr. Ferti Yeni J., M.Pd., a lecturer in Educational Technology at UNP, who served as the media expert in this study. The validation process was carried out twice on July 28, 2025, to ensure that the developed Quizizz Paper Mode learning media met the required quality standards and to allow for revisions based on expert feedback. The validation was conducted using a structured validation sheet designed to assess the feasibility of the learning media, particularly focusing on the font or lettering aspects, such as readability, font size, consistency, and clarity of text presentation. The results indicated that the font design used in the Quizizz Paper Mode media was appropriate and supported ease of reading for elementary school students. This finding suggests that the visual presentation of the media is effective in facilitating students’ comprehension and comfort during learning activities, thereby contributing positively to the overall quality and usability of the learning media. Table 1 presents the final results of the media validation conducted by the media expert, summarizing the scores, presentation percentages, validity categories, and validation averages obtained from the first and second validation stages.

Table 1. Final Results of Media Validation

| Validation     | Total score | Presentation | Category   | Validation Average Media |
|----------------|-------------|--------------|------------|--------------------------|
| 1st Validation | 34          | 85%          | Valid      | 90%                      |
| 2nd validation | 38          | 95%          | Very valid | Very valid               |

The media validation results indicate a significant improvement in quality between the first and second validation stages. In the first validation, the media obtained a total score of 34 with a presentation percentage of 85%, which placed it in the “valid” category, suggesting that the media was feasible for use but still required minor revisions. After improvements were made based on expert feedback, the second validation showed an increased total score of 38 with a presentation percentage of 95%, categorized as “very valid.” The overall validation average reached 90%, confirming that the developed media met very high validity standards. This increase demonstrates that the revisions effectively enhanced the media’s presentation quality, making it more appropriate, clear, and suitable for use as an instructional medium in the learning process.

### c. Analysis of the Results of the Language Expert Validity Test

The results of the language validation test were obtained through an assessment conducted by a linguist, Dr. Desyandri, M.Pd., who serves as a lecturer in the Elementary School Teacher Education Program (PGSD) at the Faculty of Education (FIP) of UNP. The language validation process was carried out in two stages to ensure the accuracy and appropriateness of language use in the developed learning media. The validation was conducted on July 21, 2025, by providing the linguist with a structured validation sheet that focused on several key aspects, including the effectiveness of language, clarity of instructions, readability, and conformity with standard Indonesian language rules. This repeated validation process allowed the researcher to revise and refine the media based on expert feedback, ensuring that the language used was clear, communicative, and suitable for fourth-grade elementary school students. Overall, the language validation results indicated that the media met the required linguistic standards and supported effective communication of learning content. The summary of the final results of the language validation conducted in two stages is presented in Table 2.

Table 2. Final Results of Language Validation

| Validation     | Total score | Presentation | Category   | Validation Average Media |
|----------------|-------------|--------------|------------|--------------------------|
| 1st Validation | 17          | 85%          | Valid      | 90%                      |
| 2nd validation | 19          | 95%          | Very valid | Very valid               |

The results of the media validation indicate that the developed learning media has a very high level of feasibility. In the first validation, the media obtained a total score of 17 with a presentation percentage of 85%, which falls into the valid category, showing that the media was generally appropriate for use but still required minor revisions. After improvements were made based on the expert's suggestions, the second validation showed an increase in the total score to 19 with a presentation percentage of 95%, categorized as very valid. The increase in scores between the first and second validations demonstrates that the revisions effectively enhanced the quality of the media, particularly in aspects related to presentation. Overall, the validation average of 90% places the media in the very valid category, indicating that it meets the required standards and is suitable to be implemented in the learning process.

### *Analysis of the Results of the Practicality Test of Learning Media*

#### a. Practical Test Results of Students at Three Schools

The results of the student practicality test conducted across three elementary schools are summarized in Table 3, detailing the total scores obtained, maximum possible scores, percentages, and corresponding practicality categories.

Table 3. The Results of Students at Three Schools

| No | School            | Total Scores Obtained | Maximum Score | Percentage | Category       |
|----|-------------------|-----------------------|---------------|------------|----------------|
| 1  | SDN 07 Sungai Aur | 342                   | 360           | 95%        | Very Practical |
| 2  | SDN 02 Sungai Aur | 323                   | 340           | 95%        | Very Practical |
| 3  | SDN 16 Sungai Aur | 333                   | 360           | 92,5%      | Very Practical |

The results and discussion of the practicality test of the Quizizz Paper Mode learning media, based on questionnaires administered to students, revealed a consistently very high level of practicality across all participating schools. At the trial school, SDN 07 Sungai Aur, the media achieved a practicality percentage of 95%, indicating that almost all students perceived the media as easy to use, engaging, and supportive of their learning activities. Similarly, at the research school SDN 02 Sungai Aur, the practicality level also reached 95%, reflecting students' positive responses toward the clarity of instructions, attractiveness of the presentation, and suitability of the content for IPAS learning. Meanwhile, SDN 16 Sungai Aur recorded a slightly lower yet still very high practicality percentage of 92.5%, which nonetheless falls within the "very practical" category. Overall, these findings demonstrate that Quizizz Paper Mode is well accepted by students, effectively facilitates active participation, and aligns with learners' needs, thereby supporting its implementation as an interactive learning medium in elementary science education.

#### b. Teacher Needs Analysis

The results of the teacher needs analysis across the participating schools are presented in Table 4.

Table 4. Teacher Needs Analysis

| School            | Percentage | Category      |
|-------------------|------------|---------------|
| SDN 02 Sungai Aur | 95%        | Highly Needed |
| SDN 16 Sungai Aur | 95%        | Highly Needed |
| SDN 07 Sungai Aur | 95%        | Highly Needed |

Based on the data presented in Table 4, the teacher needs analysis conducted in the three participating elementary schools revealed a consistent and high level of demand for interactive learning media, with an average percentage of 95%, which falls into the "highly needed" category. This finding indicates that teachers share similar perceptions regarding the importance of innovative instructional media in the learning process. Teachers emphasized that the use of interactive media such as Quizizz Paper Mode is essential to support clearer and more systematic material delivery, attract students' attention, and foster active participation during classroom activities. In addition, this media was perceived as helpful in creating a more efficient and objective evaluation process, allowing teachers to assess students' understanding in an engaging and structured manner. The high level of need expressed by teachers also reflects existing challenges in conventional teaching methods, which often rely on limited instructional resources and less interactive

approaches. Therefore, these results confirm that the development of Quizizz Paper Mode is relevant and aligned with the actual needs of elementary school teachers, particularly in supporting more engaging, effective, and student-centered learning experiences.

### c. Student Needs Analysis

The results of the student needs analysis are presented in Table 5. This table summarizes the percentage scores and categories of student needs across three elementary schools in Sungai Aur.

Table 5. The Student Needs Analysis

| School            | Persentase | Category  |
|-------------------|------------|-----------|
| SDN 02 Sungai Aur | 85%        | Very Good |
| SDN 16 Sungai Aur | 95%        | Very Good |
| SDN 07 Sungai Aur | 95%        | Very Good |





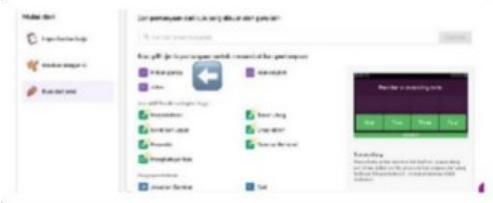
The results of the student needs analysis revealed that learners at SDN 02 obtained a score of 85%, while those at SDN 07 and SDN 16 each achieved 95%, all of which fall into the very good category. These findings indicate that students have a strong demand for learning media that are engaging, enjoyable, and capable of facilitating quick and clear understanding of the learning material. The high percentages also suggest that students are highly receptive to the integration of interactive elements in the learning process. In particular, students expressed a strong preference for media that incorporates quizzes, as quizzes are perceived to make learning more interesting and challenging while reducing boredom. The inclusion of quizzes is considered effective in increasing students' motivation, active participation, and focus during lessons. Consequently, these results support the development and implementation of interactive learning media, such as Quizizz Paper Mode, as they align well with students' needs and learning preferences and have the potential to enhance overall learning engagement and comprehension.

### *Design*

Based on the results of the analysis stage, the learning media were systematically designed by considering key aspects such as material suitability, clarity of presentation, language appropriateness, and the effectiveness of evaluation instruments. The learning materials were structured in accordance with the Capaian Pembelajaran (CP), Tujuan Pembelajaran (TP), and Alur Tujuan Pembelajaran (ATP) of the Independent Curriculum to ensure alignment with curriculum standards and learning objectives. In terms of presentation, the media adopted a simple yet attractive design, employing harmonious color combinations, readable fonts, and relevant images to support students' visual comprehension and sustain their learning interest. Furthermore, interactive quizzes using Quizizz were integrated as an evaluation tool to promote active student engagement, enhance problem-solving skills, and reinforce conceptual understanding. The immediate feedback provided through these quizzes also enabled students to monitor their learning progress, fostering a more interactive and student-centered learning experience.

To provide a clearer picture of how the Quizizz platform is utilized as an interactive evaluation tool in the learning process, Table 6 presents the step-by-step procedures for using Quizizz, starting from account access to quiz sharing for classroom implementation.

Table 6. The Interactive Tool of Quizizz

|  |  |
|--|--|
| <p>1. Opening Quizizz</p> <ol style="list-style-type: none"> <li>1) Have an active Google account/email address</li> <li>2) Open the link <a href="https://webflow-dev.quizizz.com/">https://webflow-dev.quizizz.com/</a> in a web browser</li> </ol>  |    |
| <p>2. Login or Sign Up</p> <ol style="list-style-type: none"> <li>1) Click the login icon in the top right corner.</li> <li>2) Choose to log in using your Google account or email address.</li> <li>3) If you don't have an account, click Sign Up to create one.</li> </ol>                      |   |
| <p>3. Quizizz Dashboard</p> <ol style="list-style-type: none"> <li>1) After logging in, users will be directed to the dashboard.</li> <li>2) This page contains the home, library, results, classes, and differentiation menus.</li> </ol>   |  |
| <p>4. Creating a New Quizizz</p> <ol style="list-style-type: none"> <li>1) On the dashboard page, click the Create button in the top right corner.</li> <li>2) Select a quiz.</li> <li>3) Add a short description for easy recognition.</li> </ol>   |  |
| <p>5. Adding Questions</p> <ol style="list-style-type: none"> <li>1) Click the + New Question button to start adding questions.</li> <li>2) Select the question type: Multiple Choice, True/False, Fill-in-the-Blank, Poll, Open-Ended.</li> <li>3) Select the multiple-choice section.</li> </ol> |  |

#### 6. Filling in the Question Content

- 1) Type the question in the space provided.
- 2) Add answer options (for multiple-choice questions).
- 3) Mark the correct answer with a checkmark.
- 4) If necessary, add images, videos, or audio to clarify the question.



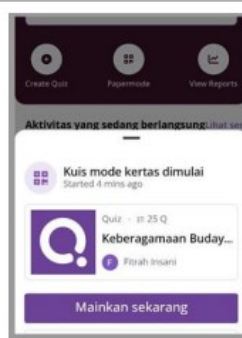
#### 7. Saving Questions

- 1) Once all questions are created, click Save.
- 2) The quiz will be saved in the teacher's account library.



#### h. Sharing a Quiz

- 1) Click on the quiz you created.
- 2) Select the usage mode: Choose paper mode.
- 3) Start a Live Quiz → play together live



### *Development*

This results and discussion stage focuses on producing a revised version of the Quizizz Paper Mode learning media through a systematic validation and improvement process based on expert feedback. The media was evaluated by subject matter experts to assess the accuracy, relevance, and suitability of the content with the learning objectives, by media experts to review the design, layout, readability, and technical aspects, and by language experts to ensure clarity, correctness, and appropriateness of language for fourth-grade students. The validation results provided constructive suggestions related to content organization, visual presentation, and language refinement, which were carefully analyzed and used as the basis for revising the media. Revisions were conducted iteratively until all recommended improvements were implemented and the validation scores met the predetermined validity criteria. As a result, the Quizizz Paper Mode learning media achieved a valid classification and was considered feasible and ready to be implemented in the learning process to support interactive and effective IPAS instruction.

During the development stage, the designed learning media underwent a rigorous validation process involving three expert validators to ensure its quality, accuracy, and suitability for fourth-grade science learning. The validators consisted of a language expert, Dr. Desyandri, M.Pd., who evaluated linguistic clarity, readability, and appropriateness of language use; a media expert, Dr. Petri Yeni J, M.Pd., who

assessed the visual design, layout, interactivity, and technical aspects of the learning media; and a content expert, Dr. Yeni Erita, M.Pd., who reviewed the relevance, accuracy, and alignment of the material with the curriculum and learning objectives. The validation process was conducted iteratively, with each validator providing constructive feedback and suggestions for improvement. Revisions were made based on this input until the media met the established validity criteria. As a result, the learning media was declared valid and appropriate for implementation, indicating that it effectively integrates linguistic, visual, and content elements to support meaningful learning experiences for fourth-grade students.

### ***Implementatiton***

The Quizizz Paper Mode learning media that has been declared valid was then implemented in three schools. The trial was conducted at SDN 07 Sungai Aur on August 5, 2025, with 18 students, at SDN 02 Sungai Aur on August 6, 2025, with 17 students, and at SDN 16 Sungai Aur on August 7, 2025, with 18 students. The implementation consisted of three stages, namely a pre-test, learning using the Quizizz Paper Mode media, and a post-test. The pre-test was given to determine the students' initial abilities. Next, the learning began with a video screening as an introduction to the material, then continued with a quiz using Quizizz Paper Mode, which also served as a post-test to measure improvements in student learning outcomes.

### ***Evaluation***

The evaluation phase, as the final stage of this research, was conducted to comprehensively assess the success of the Quizizz Paper Mode learning media in supporting the learning process. This phase involved collecting data through teacher response questionnaires to evaluate the feasibility, ease of use, and relevance of the media to classroom instruction, as well as student response questionnaires to measure students' interest, engagement, and motivation during learning activities. In addition, the effectiveness of the media was examined through learning outcome tests, which compared students' performance before and after the implementation of Quizizz Paper Mode. The results of these evaluations showed positive responses from both teachers and students, indicating that the media was practical, engaging, and well-aligned with learning objectives. Furthermore, the improvement in students' learning outcomes demonstrated that Quizizz Paper Mode contributed to more effective science learning, suggesting that this media can be a suitable and promising tool to enhance the quality of instruction in elementary schools.

### ***Effectiveness***

The effectiveness of the learning media based on Quizizz Paper Mode can be observed from the results of student activity observations conducted after the implementation of the media in the learning process. The observation results indicate that students showed higher levels of engagement, participation, and enthusiasm during learning activities compared to conventional learning methods. Students were more actively involved in answering questions, discussing learning

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materials, and completing tasks provided through the Quizizz Paper Mode, which created a more interactive and enjoyable learning atmosphere. In addition, the use of this media encouraged students to focus more on the lesson, increased their motivation to learn, and reduced passive behavior in the classroom. These findings suggest that Quizizz Paper Mode effectively supports student-centered learning by fostering active participation and improving learning dynamics, which ultimately contributes to better understanding of the learning material and improved learning outcomes. The effectiveness of the Quizizz Paper Mode-based learning media in improving student learning outcomes is further illustrated in Table 7, which presents a summary of the average pre-test scores, post-test scores, and N-Gain values across the three schools.

Table 7. Summary of Average Pre-Test, Post-Test, and N-Gain Scores

| School name       | Pre-Test Average | Post-Test Average | N-Gain Score | Category |
|-------------------|------------------|-------------------|--------------|----------|
| SDN 07 Sungai Aur | 58.59            | 95.82             | 0.89         | Tall     |
| SDN 02 Sungai Aur | 56.71            | 92.06             | 0.80         | Tall     |
| SDN 16 Sungai Aur | 53.11            | 90.22             | 0.77         | Tall     |

These results indicate that in all three schools, the interactive learning media developed significantly improved student learning outcomes. The significant increase in average post-test scores compared to pre-test scores demonstrates the effectiveness of the media in fostering student understanding of the subject matter. When comparing schools, there is consistent effectiveness within the same N-Gain category, namely High. School 1 had an average N-Gain of 0.77, School 2 was slightly higher at 0.80, while School 3 achieved the highest score at 0.89. These differences may be caused by several factors, such as student readiness, intensity of media use, and the learning environment conditions of each school.

### Discussion

The study results at SDN 07 Sungai Aur indicated that using Quizizz Paper Mode media in science learning significantly boosted student engagement. Prior to using the media, the students' average pre-test score was 58.58, suggesting that their initial understanding of the material was still at a moderate level. After the treatment, the post-test score increased to 95.82, indicating that learning became more effective and meaningful. The learning process at this school runs more interactively, where students are not only passively receiving information, but actively participating in challenging quiz questions. This finding aligns with the research by Putri & Pujiawati (2025), who reported that the development of interactive media based on Quizizz Paper Mode in IPAS learning significantly improved students' understanding and learning completeness in Grade IV elementary students.

At SDN 02 Sungai Aur, student learning outcomes also showed a similar pattern of improvement. The average pre-test score was only 56.71, but increased to 85.06 after learning with *Quizizz Paper Mode*. The student learning process at this school showed a change in learning behavior, from previously tending to be passive to

more enthusiastic in participating in learning. Students found it easier to understand the science material because the media used not only presented questions but also provided a fun learning experience. This is relevant to research by Fauziah & Sofian (2023) which showed that *Quizizz Paper Mode* not only improves academic achievement but also makes students more actively involved in interactive learning.

At SDN 16 Sungai Aur, although students' average pre-test score was lower than the other two schools, at only 53.11, the post-test results showed a remarkable improvement, reaching 90.22. This increase of 37.11 points demonstrates that *Quizizz Paper Mode* is particularly effective for students with initially lower abilities, helping them enhance their understanding of science material. The learning process, which was initially challenging, became more engaging and enjoyable, allowing students to grasp the material more quickly and confidently. This finding aligns with the study by Putri & Pujiawati (2025) in "Teacher and Students' Perceptions of *Quizizz Paper-Mode* as English Formative Assessment Media on Tenth Grade Students", which confirmed that *Quizizz Paper Mode* can increase student interest and concentration, thereby positively influencing learning outcomes. These results further support the notion presented in the journal "Development of Interactive Media Based on *Quizizz Paper Mode* in IPAS Learning in Grade IV of Elementary School", highlighting that interactive *Quizizz*-based media fosters active participation, motivation, and improved comprehension across different student ability levels.

Overall, the learning process at all three schools exhibits a consistent pattern: *Quizizz Paper Mode* creates a more lively, interactive, and enjoyable learning environment. Students are more willing to try answering questions, even those who previously tended to be passive. This active engagement makes the social studies learning process less monotonous and more varied and challenging. This finding aligns with Hasibuan et al. (2025), whose research on the development of interactive e-modules based on Kvisoft Flipbook with discovery learning models in arthropod material demonstrated that interactive media can enhance student learning outcomes. Similarly, the current study on the development of interactive media based on *Quizizz Paper Mode* in IPAS learning for Grade IV students shows that quiz-based, student-centered learning tools effectively improve engagement and academic achievement.

Furthermore, a comparison of pre-test and post-test scores across three schools showed that this media successfully reduced the gap in understanding among students. At SDN 16, for example, students who previously scored low were helped and matched the achievements of other students. Meanwhile, at SDN 07 and SDN 02, students who already had sufficient initial understanding were still able to improve their achievement to reach high standards. This is relevant to research by Pamungkas & Raharjo (2024), which stated that *Quizizz Paper Mode* significantly influenced student learning motivation and formative assessment in the Independent Curriculum, as this media adapts to the needs of students with diverse abilities.

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Thus, it can be concluded that the science learning process through *Quizizz Paper Mode* at SDN 07, SDN 02, and SDN 16 Sungai Aur was effective because it succeeded in changing the classroom atmosphere to be more interactive and motivating students to be actively involved. The significant improvement in post-test results shows that this media is not only useful as an evaluation tool, but also as a learning tool that supports the optimal achievement of basic competencies. This finding is in line with all previous research that confirms the superiority of *Quizizz Paper Mode* as an innovative media in improving learning outcomes, motivation, interest, and student engagement.

#### 4. Conclusion

Based on the research results, the *Quizizz Paper Mode* learning media developed was proven to be valid, practical, and effective for use in science learning in elementary schools. The validity test stage by media, material, and language experts showed that this media met the criteria of very valid after going through a revision process in the first test and was declared suitable for use without further improvements in the second test. In terms of practicality, the results of teacher and student questionnaires in three schools showed a very practical category, indicating that this media is easy to use, interesting, and appropriate to learning needs. In addition, the effectiveness of the media is also seen from the significant increase in student learning outcomes, indicated by the N-Gain value of 0.77 in SDN 16, 0.80 in SDN 02, and 0.89 in SDN 07, all of which are in the high category. These findings confirm that *Quizizz Paper Mode* is not only valid in content and appearance and practical in use, but also able to increase student understanding and engagement so that it is worthy of being implemented as a learning innovation in elementary schools.

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