

Validity of Artificial Intelligence-Based Interactive Chatbot Learning Media in Elementary School Science and Social Studies (IPAS) Learning

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Abstract

Science and Social Studies (IPAS) learning in elementary schools is still predominantly supported by conventional learning media, resulting in limited student engagement during the learning process. This study aimed to determine the validity of an Artificial Intelligence-based interactive learning media for fifth-grade IPAS learning at SD Negeri 01 Sedayulawas. The validation process involved three validators: a media expert, a subject matter expert, and an elementary school practitioner. The study employed a Research and Development (R&D) approach using the ADDIE model. The learning media was developed through Canva and integrated with an AI-powered chatbot. Media validity was evaluated by media experts, subject matter experts, and education practitioners using a Likert-scale assessment. The results indicated that the developed media achieved a very valid category across the aspects of presentation, content, organization, and language. Therefore, the Artificial Intelligence-based interactive learning media is considered valid and suitable for use as an alternative learning resource for IPAS in elementary schools.

Abstrak

Pembelajaran Ilmu Pengetahuan Alam Sosial (IPAS) di sekolah dasar masih didominasi penggunaan media konvensional sehingga keterlibatan peserta didik dalam pembelajaran belum optimal. Penelitian ini bertujuan untuk mengetahui validitas media pembelajaran interaktif berbasis Artificial Intelligence pada mata pelajaran IPAS kelas V SD Negeri 01 Sedayulawas. Penelitian menggunakan metode Research and Development (R&D) dengan model ADDIE. Media dikembangkan melalui Canva yang terintegrasi dengan chatbot AI. Validitas media dinilai oleh ahli media, ahli materi, dan praktisi pendidikan menggunakan skala Likert. Hasil penelitian menunjukkan bahwa media memperoleh kategori sangat valid pada aspek penyajian, isi, sistematika, dan kebahasaan. Dengan demikian, media pembelajaran interaktif berbasis AI dinyatakan valid dan layak digunakan sebagai sumber belajar IPAS di sekolah dasar.

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INTRODUCTION

The need for innovative learning media that align with the characteristics of 21st-century learners continues to increase. However, the learning process in elementary schools is still predominantly dependent on

textbooks as the primary learning resource. As a result, students' participation in learning activities has not been fully optimized, and they tend to become easily bored during the learning process (Purnama Aini & Masykur, 2018).

Similar findings were reported by Hafiz Aldwinarta et al. (2024), who found that the dominance of textbook-based instruction leads students to perceive learning activities as less engaging, which may contribute to feelings of boredom. This condition highlights the need for the development of learning media that can foster more effective interaction and enhance student engagement in the learning process. To address this issue, an Artificial Intelligence (AI)-based interactive learning media was developed, enabling students to interact with learning content more actively and receive immediate responses that support their understanding of the material.

The findings of the study conducted by Ratno et al., (2023) found that google sites-based learning media developed for elementary science education was suitable for implementation in learning process. These findings indicate that the use of web-based technology can support the delivery of learning materials in a more engaging, interactive, and accessible manner for students. Therefore, the integration of digital technology into learning media can serve as an alternative approach to improving the quality of learning in elementary schools. Interactive learning media have the potential to enhance students' engagement in the learning process by presenting learning materials in a more appealing way, thereby fostering active participation and responsiveness during learning activities (Rosiyanti & Muthmainnah, 2018). In line with this, Wulandari (2022) stated that interactive learning media serve as an engaging, enjoyable, and effective learning tool that is well suited to the characteristics of today's generation.

One promising innovation in interactive learning media is the integration of

Artificial Intelligence (AI), particularly through the use of educational chatbots. The study conducted by Azmi & Widayat (2025) revealed that the implementation of AI-based chatbots in elementary education can support teachers in facilitating a more interactive and effective learning experience. According to Sandu & Gide (2019, as cited in Hafiz Aldwinarta et al., 2024), AI-based chatbots can serve as interactive and personalized learning tools, as they are able to deliver responses and feedback that are relevant to users' inquiries.

Consistent with this perspective, Hidayatullah et al., (2025) emphasized that the use of Artificial Intelligence should be implemented wisely and with an educational focus in order to support the development of students' digital literacy and critical thinking skills. Furthermore, (Labadze et al., 2023, as cited in Damayanti et al., 2025) explained that AI chatbots can assist students in understanding learning materials by providing direct explanations, answering questions promptly, offering practice exercises, and recommending additional learning resources.

Based on observations conducted at SD Negeri 01 Sedayulawas, it was found that the learning abilities of fifth-grade students in IPAS had not yet developed optimally. Based on the result of preliminary survey conducted among fifth-grade students at SD N 01 Sedayulawas, approximately 85% of the students experienced difficulties when faced with tasks requiring analytical. In addition, most students tended to act as passive recipients of information rather than actively participating in the learning process. Studies have suggested that learning processes that fail to actively involve students may lead to decreased engagement and increased boredom during learning activities

(Chaudhary et al., n.d.). Therefore, the development of Artificial Intelligence-based interactive learning media that integrates the Canva platform with chatbot features is viewed as an innovative and relevant approach to supporting IPAS learning in elementary schools. The novelty of this study

RESEARCH METHODOLOGY

This study employed a Research and Development (R&D) method by adopting the ADDIE model proposed by Branch (2009), which consists of five stages: analysis, design, development, implementation, and evaluation. During the analysis stage, learning-related problems were identified through classroom observations and interviews involving fifth-grade students and teachers at SD Negeri 01 Sedayulawas.

This stage focused on analyzing students' needs, the characteristics of fifth-grade students, and the implementation of the Merdeka Curriculum in IPAS learning. The findings from this stage served as the basis for the design stage, which involved developing the media framework and mapping the learning content. In the development stage, an interactive learning medium was created using the Canva platform integrated with an Artificial Intelligence-based chatbot to facilitate learning interactions on the topic "Indonesiaku Kaya Raya" for fifth-grade students.

The product validation process involved three validators: a subject matter expert, a media expert, and an educational practitioner, namely a fifth-grade teacher at SD Negeri 01 Sedayulawas. The validators were selected based on their relevant expertise

lies in the integration of Canva and an Artificial Intelligence chatbot, allowing students to interact directly with the learning media, receive instant feedback, and engage in a more personalized learning process than is typically offered by conventional digital learning media.

and professional experience. The subject matter expert had expertise in elementary science education, the media expert had competence in educational media design and technology integration, and the educational practitioner had experience in teaching fifth-grade IPAS. All feedback and suggestions provided by the validators were used to refine and improve the developed media.

The resulting product was an Artificial Intelligence-based chatbot designed for the "Indonesiaku Kaya Raya" topic. The product was subsequently evaluated by experts and practitioners to determine its validity. The evaluation employed an instrument covering four main aspects: presentation feasibility, content feasibility, media organization, and language appropriateness. The collected data were analyzed using a Likert scale and descriptive quantitative methods to determine the validity level of the developed media.

The validity level was determined based on the scores provided by two experts and one practitioner acting as validators using a Likert scale. The validity categories used as references for interpreting the evaluation results are presented in Table 2.1. Furthermore, the validity scores of the AI-based chatbot media were interpreted according to the predetermined categories of the scale.

Table 1 Likert Scale For Expert Validation

Scale	Category
4	Very Good

3	Good
2	Fair
1	Poor

Source: (Ridwan, 2013)

The mean score from all validators was 100. The validity scores obtained were calculated for each evaluation aspect using the subsequently interpreted according to the Likert following formula: $\text{Validity Score} = (\text{Total Score Obtained} / \text{Maximum Possible Score}) \times 2.2$. The validity scores obtained were subsequently interpreted according to the Likert scale interpretation categories shown in Table 2.2.

Table 2 Validity Categories Based on the Likert Scale

Average Score	Category
0–20	Invalid
21–40	Less Valid
41–60	Moderately Valid
61–80	Valid
81–100	Highly Valid

Research data were collected using a validation sheet based on a 4-point Likert scale, complemented by comment and suggestion sections for each validator (Sugiyono, 2019). The validation data were then analyzed using descriptive quantitative techniques by calculating the average score for each assessment aspect. The learning media were considered valid if they achieved a validity score of at least 61%, which falls within the valid category according to the validity criteria presented in Table 2.2 (Sugiyono, 2019).

RESULT AND DISCUSSION

This study resulted in the development of an Artificial Intelligence-based interactive learning media for fifth-grade IPAS on the topic “Indonesiaku Kaya Raya.” The media was developed using the Canva platform and integrated with an AI-powered chatbot feature. The interface of the developed learning media is presented in the following figures:



Figure 1. Presents the home page of the learning media, which serves as the entry point for users to access various features.

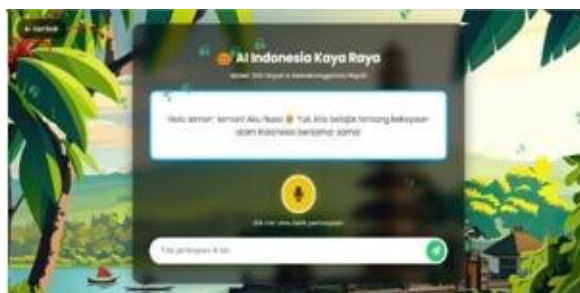


Figure 2. shows the AI-based chatbot feature used to provide immediate responses to students' questions

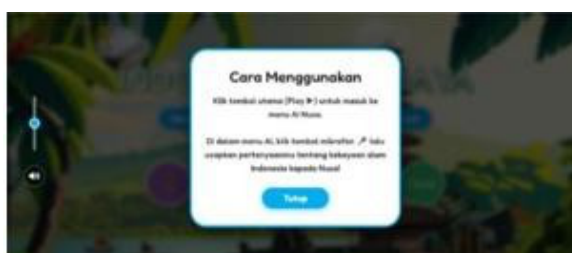


Figure 3. shows the interactive quiz feature designed to evaluate students' understanding of the material.



Figure 4. shows the user guide designed to help students use the learning media effectively.

The Artificial Intelligence-based interactive learning media for the topic “Indonesiaku Kaya Raya” was developed through a design process that comprehensively integrated various visual and functional elements. The development process included interface design, content organization, color selection, the use of supporting illustrations, and the integration of an AI-powered chatbot tailored to the characteristics and developmental stage of fifth-grade elementary school students. The interface was designed to facilitate easy navigation and improve user engagement, while the organized content enabled students to access learning materials systematically. Visual appeal

and support students’ understanding of the material. In addition, the chatbot was embedded into the Canva-based learning media through an external link, allowing students to interact with the chatbot, ask questions related to the learning materials, and receive immediate responses during the learning process. The interactive quiz feature was designed to assess students’ understanding of the material, whereas the user guide provided instructions to help students access and use the learning media effectively.

The various features were designed to enable students to use the media independently. A user guide feature was provided to help students understand the functions of each menu

more easily. Furthermore, the learning materials were directly integrated with the Canva platform, allowing content to be presented more attractively through a combination of text, images, animations, and interactive videos. The media also includes an AI-based chatbot that enables students to obtain answers and explanations related to the learning materials. In addition, an interactive quiz was incorporated as an evaluation tool to assess students' understanding after studying the presented content. Following the development stage, the

media underwent a validation process involving experts and practitioners to determine its feasibility before implementation with students. The validity assessment was conducted based on four main aspects: presentation feasibility, content feasibility, media organization, and language appropriateness. The results of the validation conducted by all validators are presented in Table 4.4. Appropriate color selection and supporting illustrations were incorporated to enhance.

Table 2 Validation Results of the AI-Based Interactive Chatbot Learning Media

No	Assessment Aspect	Average Score by Aspect			Mean Score
		Validat or 1	Validat or 2	Validat or 3	
Presentation Feasibility					
1.	Display Quality	4	3.7	4	3.9
2.	Page Layout	4	4	4	4
3.	Appropriateness of Font Type Used in the AI Chatbot	4	4	4	4
4.	Color Quality	4	4	4	4
5.	Interactivity Quality	4	4	4	4
Average Presentation Score					3.9
Validity Score (%)					99.5
Category					Highly Valid
Content Feasibility					
1.	Breadth and Accuracy of Concepts	4	4	4	4
Average Presentation Score					4
Validity Score (%)					100

					Highly Valid
Category					
AI Chatbot Media Organization					
1.	AI Chatbot Cover Design	3	4	4	3.7
2.	Instructions for Using the AI Chatbot Media	4	4	4	4
3.	Characteristics of the AI Chatbot Media	4	4	4	4
4.	Indonesiaku Kaya Raya Learning Content Subsection	4	4	4	4
Average Media Organization Score					3.9
Validity Score (%)					97.5

					Highly Valid
Category					
Language Feasibility					
1.	Language Use	4	4	4	4
2.	Language Structure	4	4	4	4
3.	Use of Terminology	4	4	4	4
Average Language Feasibility Score					4
Validity Score (%)					100

					Highly Valid
Category					

The validation stage was conducted to assess the feasibility of the AI chatbot learning media developed in this study. The media was designed as a supporting tool to help students acquire knowledge independently through the use of Artificial Intelligence technology specifically developed for IPAS learning materials.

Based on the analysis of the validation data, the media was evaluated by experts and practitioners across several assessment aspects. Presentation feasibility aspect consisted of five evaluation components, namely display quality, the appropriateness of the font type used in the AI chatbot media, page layout quality, color quality, and the level of media interactivity. The evaluation results showed that the presentation aspect obtained a mean score of 3.9 with a validity score of 99.5%, was calculated based on the total score obtained from the validator assessments compared with the maximum possible score, as presented in Table 4.4. Therefore, this aspect was categorized as highly valid.

The content feasibility aspect focused on the breadth and accuracy of the concepts presented in the learning media. This aspect assessed the alignment of the IPAS learning materials with the intended learning outcomes, ensuring that the content could be understood accurately by students and was consistent with scientifically accepted concepts. Furthermore, the selection of the theme “Indonesiaku Kaya Raya” was relevant to the contextual learning approach advocated by the Merdeka Curriculum (Kemendikbudristek, 2022) as the content is closely related to students’ social and cultural contexts.

The components related to the scope and accuracy of the concepts were classified as highly valid. In terms of media feasibility, the validity achievement in the aspects of attractiveness and graphic design reflects the

successful utilization of the Canva platform in providing an aesthetically appealing display that is appropriate for the visual characteristics of elementary school students. Furthermore, Arsyad (2020) emphasizes that visual appeal is one of the key factors in maintaining students' attention throughout the learning process.

The AI chatbot media systematics consisted of four main components: the cover page, user instructions, media characteristics, and the subchapter entitled “Indonesia Kaya Raya”. The overall validity score for the media systematics was 3.9. This result indicates that the media structure was well organized and appropriate for use in the learning process.

However, according to the media expert validator, “the AI chatbot cover should include the name of the media developer.” This suggestion was intended to provide a clearer identity of the developer and to make the media presentation more complete.

The language feasibility aspect was assessed based on three components: language use, language structure, and terminology usage. Based on the analysis of the assessment results from the three experts, the language aspect was categorized as highly valid. This finding indicates that the language used in the media is easy for students to understand and employs formal language that is consistent with the rules and standards of the Indonesian language. This result is supported by (Nurlaili, 2011, cited in Pawahyuning Trihanis Himala, 2016) who states that clear sentence structures can help students understand the learning material more easily.

The presence of the AI chatbot feature serves as the primary distinguishing characteristic of this media compared to conventional learning media. The novelty of the developed product lies in the integration of Canva-based learning media with an Artificial Intelligence chatbot, which allows students to

interact directly with the learning content and receive immediate responses. This feature extends the function of digital learning media beyond content presentation by providing interactive and personalized learning assistance.. The chatbot enables students to engage in interactive dialogue, ask questions, and receive immediate feedback, thereby fostering greater learning autonomy.

This is supported by the findings of Damayanti et al., (2025) who reported that AI-based chatbots in elementary science education can enhance student engagement and promote independent learning. Similarly, Fazriati et al. (2025) found that educational chatbots assist teachers in creating more interactive and effective learning experiences.

Based on the analysis conducted by experts and practitioners, the AI chatbot-based learning media developed for the IPAS subject was considered highly valid and suitable for implementation. In the presentation feasibility aspect, the media obtained a score of 99.5, which falls within the highly valid category. The content feasibility aspect achieved a perfect score of 100, also categorized as highly valid. Meanwhile, the systematic organization of the chatbot media received a score of 97.5 and was likewise classified as highly valid. The language feasibility aspect also obtained a score of 100, indicating a highly valid category. Overall, the validation results demonstrate that this Artificial Intelligence-based interactive learning media is valid and feasible to be used as an alternative instructional medium for IPAS learning at the elementary school level.

CONCLUSION

This development research resulted in an Artificial Intelligence-based interactive learning media for Grade V IPAS with the theme “Indonesiaku Kaya Raya” at SD Negeri 01 Sedayulawas. The product was developed using the ADDIE model by utilizing the

Canva platform and integrating an AI-powered chatbot feature to facilitate interaction between students and learning materials. The validation results from media experts, subject-matter experts, and educational practitioners indicated that the developed media possessed a very high level of validity, with all assessment aspects achieving validity scores ranging from 97.5% to 100%, placing the media in the highly valid category, making it suitable for use as an alternative learning medium in elementary schools. This feasibility was demonstrated through the fulfillment of various assessment criteria, including visual attractiveness, readability, interactivity, alignment of the content with IPAS concepts, and consistency with the requirements of the Merdeka Curriculum. In addition to meeting the validity criteria, the evaluations provided by practitioners also indicated that this AI-based learning media has the potential to support a more active, responsive, and student-centered learning process that aligns with the characteristics of elementary school learners. The integration of the AI chatbot feature is expected to facilitate independent learning and provide immediate feedback to students during the learning process. Therefore, the developed media has the potential to serve as an innovative instructional tool that supports the implementation of IPAS learning in a more meaningful, effective, and curriculum-relevant manner within the framework of the Merdeka Curriculum.

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