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ARTICLE

Analysis of the Needs for the '*Teman Bahasaku*' Digital Media to Improve Fourth-Grade Elementary School Students' Language Skills and Creative Thinking

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Abstract

Digital technology offers important opportunities to create more interactive and integrated learning experiences for the development of elementary students' language skills and creative thinking. This study aimed to develop and conduct preliminary validation of *Teman Bahasaku*!, a web-based interactive learning medium for fourth-grade elementary school students that integrates listening, speaking, reading, and writing with creative-thinking activities and AI-supported learning features. The study employed a Research and Development (R&D) design based on the first three stages of the Four-D (4D) model: Define, Design, and Develop. A needs analysis was conducted using questionnaires to identify learning problems and media requirements, followed by the design and development of an initial prototype. The product was subsequently evaluated by three experts in learning media, Indonesian language content, and creativity, and the data were analyzed descriptively using frequencies, percentages, and mean scores. The findings indicated a need for more engaging and interactive Indonesian language learning media and resulted in an integrated platform incorporating multimedia, educational games, creative-thinking activities, learning-progress monitoring, and AI-supported writing assistance. Preliminary expert validation showed that the product was highly suitable, with scores of 99% from the media expert and 98% from both the Indonesian language and creativity experts, producing an overall mean of 98.3%. The study concludes that *Teman Bahasaku*! is a feasible and promising learning medium for further development. However, field implementation and effectiveness testing with fourth-grade students are recommended to examine its effects on language skills, creative thinking, motivation, and other learning outcomes.

Keywords: Creative thinking; Digital learning media; Elementary education; Indonesian language skills; *Teman Bahasaku*; Web-based learning.

1. Introduction

The rapid development of digital technology has significantly transformed the educational environment, including the teaching and learning of Indonesian language in elementary schools. The increasing availability of smartphones, Web-based applications, interactive multimedia, and other

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digital learning resources has created new opportunities for designing learning experiences that are more flexible, interactive, and responsive to students' characteristics. Previous studies indicate a growing trend toward the use of Web-based applications and interactive multimedia in Indonesian language learning [1][2][3]. Digital media have also demonstrated the potential to improve students' learning outcomes and support the development of specific language skills, particularly listening and writing [4][5][6]

The importance of digital transformation in Indonesian language learning is closely related to the central role of language in elementary education. Language competence is not merely about mastering vocabulary, grammar, or formal linguistic rules. It includes the ability to listen, speak, read, and write, which collectively function as instruments of communication, thinking, learning, and creative expression [7][8]. Through language, students receive information, interpret ideas, communicate their opinions, develop arguments, and construct new meanings. Therefore, the development of the four language skills should be viewed as an interconnected educational process rather than as a collection of separate technical competencies.

The Indonesian curriculum also emphasizes this broader orientation. Indonesian language learning at the elementary school level is expected not only to develop students' understanding of language rules but also to enable them to express ideas orally and in writing and to produce creative works [9]. Studies of Indonesian language instruction have similarly highlighted the importance of strengthening the four core language skills—listening, speaking, reading, and writing—as essential competencies for students continued academic development [10][11]. A balanced development of these skills is therefore necessary to prepare students for increasingly complex learning demands at subsequent educational levels.

The need for more innovative language learning has become increasingly urgent in the context of 21st-century education. Students are expected to develop communication skills, critical thinking, creativity, collaboration, and digital literacy. These competencies require learning environments that provide opportunities for students to participate actively rather than merely receive information. In Indonesian language learning, fourth-grade students begin to encounter more complex materials and increasingly need learning experiences that connect language concepts with meaningful situations and everyday experiences. Learning that is dominated by content presentation and routine written exercises may provide limited opportunities for students to communicate, explore ideas, use language authentically, and develop creative responses.

Digital technology offers a potentially relevant response to these demands because it can combine text, audio, images, video, animation, and interactive activities within a single learning environment. Such multimodal characteristics can create more varied learning experiences and support the development of language skills through meaningful activities. For example, students may listen to audio materials, respond orally, read texts, write their own ideas, and participate in interactive tasks within the same digital platform. Therefore, appropriately designed digital media can support more integrated Indonesian language learning that is interactive, contextual, and consistent with the cognitive and learning characteristics of elementary school students.

Despite the potential of digital transformation, significant educational problems remain in the development of elementary students' language skills. Various empirical findings indicate that many students continue to experience difficulties in expressing ideas orally, organizing their thoughts coherently, and writing simple texts using effective sentences [12][13]. These problems indicate that language learning is not only concerned with students' ability to understand linguistic materials but also with their capacity to use language meaningfully in communication. Students may understand certain language rules while still experiencing difficulties when required to organize ideas, select appropriate words, explain opinions, or transform their thoughts into coherent spoken or written

forms.

Reading literacy also remains an important concern. National assessment results indicate that Indonesian students' reading literacy has not yet reached the expected level, particularly in relation to text comprehension and reasoning [14][15]. Difficulty in reading is not limited to recognizing words or retrieving explicit information. Students may also encounter challenges in identifying implicit meanings, connecting information across a text, interpreting ideas, and using information as a basis for reasoning. These problems demonstrate a gap between the expected language competencies of elementary students and their actual abilities.

The difficulties experienced by students are not limited to receptive skills such as reading and listening. Productive language skills, particularly speaking and writing, also require greater attention. Students frequently experience obstacles when expressing ideas clearly, organizing their thoughts coherently, choosing appropriate words, and producing effective sentences. This condition suggests that Indonesian language learning should provide students with more opportunities to use language in meaningful contexts. Students need learning experiences that allow them to practice receiving, processing, interpreting, and communicating information rather than merely memorizing linguistic rules or completing repetitive exercises.

A further educational problem concerns the development of students' creative thinking. Learning media and classroom activities often continue to emphasize technical language competence and the production of predetermined or convergent answers. Such an approach may limit opportunities for students to explore ideas, formulate alternative responses, express different perspectives, and create original language-based works. As a result, creative thinking abilities—including fluency, flexibility, and originality—may not develop optimally [16].

Creative thinking is an important competency in 21st-century education and should be developed from the elementary school level. Students need opportunities to generate multiple ideas, consider different possibilities, and produce original responses. However, previous studies suggest that classroom learning may still tend to encourage convergent answers rather than divergent thinking [17][18]. When students are repeatedly expected to identify one predetermined correct answer, they may have fewer opportunities to experiment with ideas or use language creatively. This limitation is particularly relevant to Indonesian language learning because language should function not only as a means of reproducing correct information but also as a medium through which students can develop and communicate original ideas.

The relationship between language skills and creative thinking is therefore significant. Language provides students with the means to organize ideas, communicate alternatives, explain different perspectives, and transform imagination into spoken or written expressions. Students' creative potential may be constrained when they lack opportunities to use language openly and interactively. Conversely, creative learning activities may become ineffective when students do not have sufficient opportunities to develop their listening, speaking, reading, and writing abilities. These considerations indicate the need for instructional media that can support the simultaneous development of language competence and creative thinking.

In response to these challenges, digital learning media have received increasing attention. A number of previous studies have demonstrated that Web-based learning media can support the development of students' learning skills, including language competence and creativity [19][20][21]. Digital media offer several educational advantages because students can access materials, exercises, multimedia resources, and interactive activities through more flexible learning environments. The integration of text, images, audio, video, animations, and interactive tasks can also provide diverse learning stimuli and support students in understanding information and expressing ideas.

Research on interactive digital media has similarly demonstrated that technology-based learning activities can contribute to the development of creative thinking. Digital multimedia can provide opportunities for students to develop fluency, flexibility, and originality through reading, writing, speaking, and other interactive activities [22][23][24][25][26][27][28]. Activities based on digital storytelling and other interactive approaches can create opportunities for students to engage with language materials more actively. Rather than functioning solely as recipients of information, students can respond to texts, develop stories, express opinions, and produce their own language-based outputs.

The increasing development of AI-supported technology also provides additional possibilities for educational innovation. AI has the potential to support more interactive learning environments by enabling responsive activities and individualized engagement with learning content. Within language learning, AI-supported features may provide additional opportunities for students to interact with learning materials, explore ideas, and receive more dynamic learning experiences. However, the inclusion of AI alone does not necessarily guarantee educational effectiveness. Its pedagogical contribution depends on how AI-supported features are integrated with learning objectives, student activities, language competencies, and broader cognitive outcomes such as creativity.

Although previous research has demonstrated positive results from digital media, games, interactive activities, storytelling, and technology-supported learning, the existing studies remain limited in several important respects. Most digital learning products have been designed to improve a specific skill or competency. Some studies focus primarily on reading, while others emphasize writing, text comprehension, speaking, or other individual learning outcomes. Similarly, studies concerned with creative thinking often emphasize creativity as a separate educational outcome rather than integrating it systematically with the four language skills.

This limitation represents a specific research gap. The problem is not simply that there are still few studies concerning digital language learning or creativity. In fact, previous research has produced various digital products and demonstrated that technology can improve particular language skills and support creative activities. However, these studies generally address the relevant competencies separately. A digital product may focus on one language skill, while another product may focus on creative thinking or interactive multimedia. Consequently, the four fundamental language skills—listening, speaking, reading, and writing—are rarely designed as an integrated learning system that simultaneously develops students' creative thinking.

This gap is particularly important in the context of elementary Indonesian language learning. Listening, speaking, reading, and writing are naturally interconnected. Students may listen to information before discussing it, read a text before developing a written response, or use speaking and writing to communicate ideas generated through reading and observation. Treating these competencies as completely separate activities may not fully reflect the authentic use of language in real learning situations. Therefore, there is a need for a digital learning environment that can integrate the four language skills within connected learning experiences.

The existing gap also concerns the relationship between language learning and creativity. Previous research has shown that digital media can support either language development or creative thinking, but the instructional design of these products does not always integrate both dimensions comprehensively. A platform designed for reading may improve comprehension without providing sufficient opportunities for idea generation. Similarly, a creativity-oriented activity may encourage originality without systematically developing students' listening, speaking, reading, and writing skills. The absence of an integrated design limits the possibility of developing language competence and creative thinking simultaneously within one coherent learning environment.

Another limitation is that many digital learning products primarily function as tools for content delivery and practice. They may present information, provide exercises, and assess students' responses, but they do not always position students as active explorers of information and creators of language-based products. A more comprehensive learning platform should enable students not only to receive and understand information but also to respond, discuss, interpret, generate ideas, develop alternatives, and produce original outputs. This requires a learning design that combines language practice with exploratory and creative activities.

Therefore, the novelty of the present study lies not merely in developing another Web-based learning application. Its contribution is based on the integration of several dimensions that are often addressed separately in previous research. The proposed *Teman Bahasaku*! platform is designed to integrate listening, speaking, reading, and writing with the development of creative thinking in a single digital learning environment. The platform is intended to provide contextual, interactive, exploratory, and experience-based learning activities for fourth-grade elementary students.

Within this framework, students are expected to participate actively in the learning process. The platform is designed to support activities in which students receive and process information, communicate ideas, explore different responses, and produce language-based outputs. Creative thinking is integrated through opportunities to generate ideas, consider alternatives, develop different perspectives, and produce more original expressions. Thus, the use of digital technology is not limited to presenting multimedia content but is directed toward creating an interactive learning environment.

The integration of the four language skills and creative thinking also distinguishes the present study from digital learning products that address isolated competencies. Rather than treating listening, speaking, reading, and writing as unrelated activities, *Teman Bahasaku*! is designed to connect these skills within meaningful learning experiences. For example, students may engage with information through multimedia, interpret and discuss what they have learned, read supporting materials, and produce spoken or written creative responses. Such integration is expected to provide more authentic opportunities for language use and creative expression.

AI-supported learning features further extend the potential of this integrated design. The inclusion of AI is intended to support a more responsive and interactive digital learning environment. Nevertheless, the contribution of AI in this study is positioned within a pedagogical framework rather than as an independent technological objective. The main purpose remains the development of an educational medium that supports language learning and creative thinking. AI-supported features are therefore considered as part of the interactive learning environment rather than the sole basis of the innovation.

Accordingly, the present study addresses a clearly defined gap in previous research: the limited availability of an integrated digital learning product for elementary Indonesian language education that simultaneously combines the four language skills, creative-thinking development, and AI-supported interactivity. Existing studies have demonstrated that digital media can improve particular language skills and that technology-based activities can encourage creativity. However, these components have generally been developed separately or have been integrated only partially. The present study seeks to bring these dimensions together within one coherent learning platform.

The purpose of this study is therefore to develop and conduct preliminary validation of *Teman Bahasaku*!, a web-based interactive learning medium designed for fourth-grade elementary school students in Indonesian language learning. The platform integrates listening, speaking, reading, and writing activities with the development of creative thinking and AI-supported learning features. The preliminary validation is intended to examine the feasibility and appropriateness of the developed product before broader implementation and effectiveness testing.

The expected contribution of this study is both practical and academic. Practically, *Teman Bahasaku*! is expected to provide an alternative digital learning medium that supports more active, interactive, contextual, and creative Indonesian language learning. Academically, the study contributes an integrated instructional design that connects the development of the four language skills with creative thinking and AI-supported interactivity. By moving beyond the development of digital products focused on isolated skills, this research proposes a more comprehensive approach to elementary Indonesian language learning.

Ultimately, the development of *Teman Bahasaku*! responds to the changing demands of digital and 21st-century education. Elementary students require learning experiences that develop their capacity not only to understand language but also to use language to communicate, think, explore, create, and express ideas. The integration of listening, speaking, reading, writing, creative thinking, and AI-supported interactivity within a single digital platform is expected to provide a more meaningful learning experience. Accordingly, this study aims to contribute to the development of innovative Indonesian language learning media that is pedagogically integrated, technologically responsive, and appropriate for the learning needs of fourth-grade elementary school students.

2. Methods

2.1 Design of the Research

This study employed a descriptive quantitative method with a Research and Development (R&D) design to develop and conduct the preliminary validation of *Teman Bahasaku*, a web-based interactive learning medium for fourth-grade elementary school students in Indonesian language learning. The study was designed in response to the need identified in the previous literature and in the study's needs analysis for a more integrated digital learning environment capable of supporting the development of the four fundamental language skills—listening, speaking, reading, and writing—while simultaneously stimulating students' creative thinking.

The development process followed the Four-D (4D) model [29] which consists of the stages of Define, Design, Develop, and Disseminate [30]. This model was selected because it provides a systematic framework for identifying learning needs, designing an instructional product, developing an initial prototype, and evaluating its appropriateness through expert appraisal. The 4D model has been widely used in educational product development because it facilitates a structured transition from problem identification to product design and validation [31].

The present study was conducted through the first three stages of the 4D model: Define, Design, and Develop. The dissemination stage was not implemented as part of the present preliminary development and validation study. Accordingly, the research focused on three major outcomes: (1) identifying the needs and learning problems underlying the development of the platform; (2) designing and developing an initial prototype of *Teman Bahasaku*! and (3) conducting preliminary expert validation of the developed product.

The overall development process was conducted chronologically. First, a needs analysis was undertaken to identify problems in Indonesian language learning and to determine the requirements for a digital learning medium. Second, the results of the needs analysis were connected to the instructional objectives, learning activities, multimedia features, interface designs, and evaluation instruments. Third, an initial prototype of *Teman Bahasaku*! was developed. Finally, the prototype was evaluated by experts, and the validation results were used as the basis for product revision.

The methodological focus of this study is consistent with the conceptual framework proposed in this research. Rather than developing a digital product for only one language skill, *Teman Bahasaku*! was designed to provide an integrated learning environment in which listening, speaking, reading,

and writing are connected with activities intended to stimulate creative thinking. The development therefore emphasized the integration of multiple learning activities within one digital platform.

2.2 Research Context and Participants

The needs analysis involved 41 respondents from several provinces in Indonesia. The respondents were geographically distributed across East Java, West Java, Central Java, West Kalimantan, Riau, and Central Sulawesi. East Java represented the largest proportion of respondents, with 27 participants (65.9%), followed by West Java with 6 participants (14.%). Central Java, West Kalimantan, Riau, and Central Sulawesi were each represented by 2 respondents (4.9%). Therefore, the needs analysis included respondents from several Indonesian regions, predominantly derived from the East Java context.

The inclusion of respondents from different provinces was intended to obtain perspectives on the need for digital Indonesian language learning media from more than one geographical context. However, because the majority of respondents were from East Java, the findings of the needs analysis should primarily be interpreted as reflecting the educational context and needs represented by this sample rather than as nationally representative evidence.

The respondents had diverse teaching experience periods. The available dataset indicates that 7 respondents (17.1%) have experience period less than five years of age, 12 respondents (29.3%) were in the 5–10-year experience group, 12 respondents (29.3%) were in the 11–20-year experience of teaching group, 8 respondents (19.5%) were over 20 years of teaching experience, and one respondent each was recorded as being 41 and 53 years of teaching experience. The total number of respondents was therefore 41.

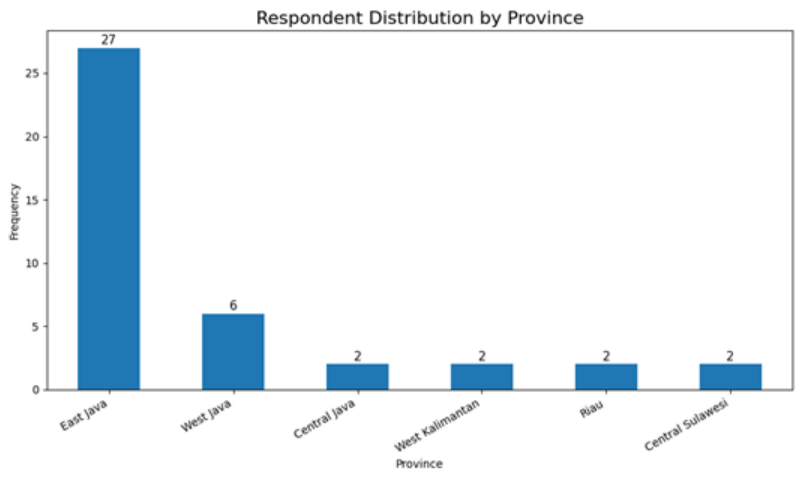

Figure 1. Provincial distribution of respondents for the "*Teman Bahasaku*" needs analysis

Since the respondents included individuals with a wide teaching preference range, the experience period distribution was interpreted carefully. The needs analysis data do not indicate that all respondents were the direct target users of the platform. Therefore, the experience period distribution describes the characteristics of the respondents who participated in the needs analysis rather than automatically representing the characteristics of fourth-grade elementary school teachers. The target users of *Teman Bahasaku*! remain fourth-grade elementary school teachers teaching their students in language, whereas the needs analysis involved respondents who provided information and perspectives relevant to the development of the digital learning medium

Table 1. Period of Teaching Experience of the Respondents

Experience Period	Frequency	Percent	Valid Percent	Cumulative Percent
Vad	< 5 years	7	17.01	17.01
	> 20 years	8	19.05	36.06.00
	11–20 years	12	29.03.00	65.09.00
	41 years	1	02.04	68.03.00
	5–10 years	12	29.03.00	97.06.00
	53 years	1	02.04	100.00.00
	Total	**41**	**100.00.00**	**100.00.00**

Based on the results of the experience period analysis, the study involved 41 respondents with diverse teaching experience characteristics. The 5–10 and 11–20 period groups had the largest number of respondents, with 12 people (29.3%) in each group. Next, there were 8 respondents (19.05%) with teaching experience over 20 years, while the under-5 years group consisted of 7 respondents (17.01%). There was one respondent with teaching experience of 41 and 53 years (2.4%), respectively. Overall, this distribution indicates that the respondents' teaching experience spans a fairly wide teaching experience period range, with the largest concentration in the 5–20 years' experience group. This diversity provides a relatively varied perspective on the development needs of the *Teman Bahasaku* media.

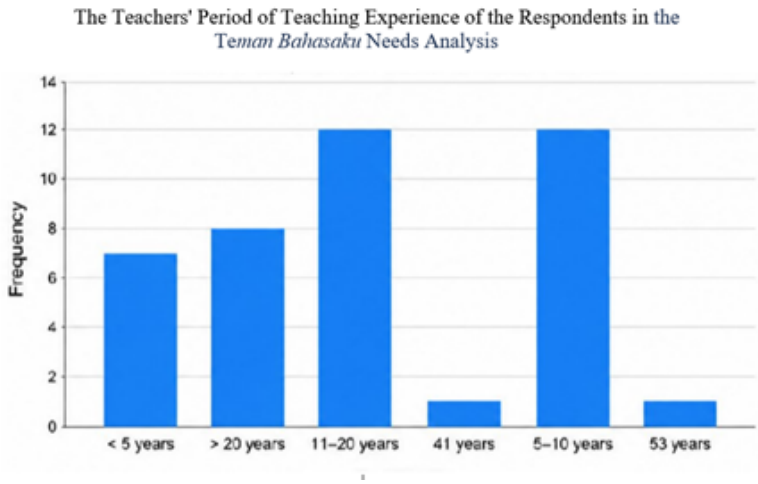

Figure 2. Period of Teaching Experience of respondents for the "*Teman Bahasaku*" Needs Analysis

Based on Figure 1, this study involved 41 respondents with a diverse range of teaching experience. There were 7 respondents (17.1%) with less than 5 years, 12 respondents (29.3%) between 5–10 years, and 12 respondents (29.3%) in the 11–20 years. Furthermore, there were 8 respondents (19.5%) have even over 20 years of teaching experience, while there was only 1 respondent each (2.4%) with 41 years and 53 years. This composition indicates that the respondents were predominantly from the 5–20 years of teaching experience group, meaning that the data on the needs for the *Teman Bahasaku* media fairly well represents the characteristics of school- teaching experience as the web-media users. However, there were also respondents from older age groups who could provide additional perspectives on the needs and use of educational media.

2.3 Define Stage: Needs and Learning Analysis

The first stage of the research was the Define stage, which aimed to establish the instructional and developmental foundation for the *Teman Bahasaku* platform [31]. This stage was necessary to ensure that the product was developed in response to actual learning needs rather than solely based on technological possibilities.

The Define stage began with a front-end analysis. This analysis focused on identifying existing conditions in Indonesian language learning, including learning problems, the use of educational media, barriers encountered in the learning process, and gaps between the expected competencies and students' learning needs. Data were obtained through observation and questionnaires. Particular attention was given to problems associated with listening, speaking, reading, writing, and creative thinking.

The analysis was based on the premise that Indonesian language learning requires more than the acquisition of isolated technical skills. The needs analysis therefore examined whether existing learning media provided sufficient opportunities for students to engage actively with language, communicate ideas, explore information, and develop creative responses. This orientation was consistent with developing a platform capable of integrating the four language skills with creative thinking.

A student analysis was subsequently conducted to identify characteristics relevant to the design of the digital medium. The analysis considered students' cognitive characteristics, prior knowledge, literacy levels, and learning needs. These considerations were used to determine the appropriateness of the content, learning activities, presentation format, and interactive elements for fourth-grade elementary school students.

The next component was a task analysis, which focused on identifying learning activities that could support the integrated development of the four language skills. Rather than treating listening, speaking, reading, and writing as entirely separate competencies, the task analysis was directed toward identifying meaningful activities through which these skills could be connected. The analysis also considered how such activities could stimulate creative thinking, including opportunities for students to generate ideas, explore alternatives, communicate perspectives, and produce language-based outputs.

A concept analysis was then conducted by reviewing the relevant Learning Outcomes (Capaian Pembelajaran or CP), Learning Objectives (Tujuan Pembelajaran or TP), and Indonesian language learning materials for fourth-grade elementary school students. This process ensured that the content incorporated into the platform was aligned with the relevant curricular expectations. The results of the front-end analysis, student analysis, task analysis, and concept analysis were subsequently used to formulate the learning objectives and competency indicators that would guide the development of *Teman Bahasaku*.

For that reason, the Define stage established the instructional basis of the platform. The findings obtained at this stage informed the selection of content, the structure of learning activities, the design of multimedia elements, and the integration of language skills and creative-thinking activities in the subsequent stages of development.

2.4 Design Stage

The second stage was the Design stage, which aimed to translate the results of the needs and learning analyses into an initial instructional and technical design for the digital platform [32]. At this stage, the researchers determined how the identified learning needs and objectives would be operationalized within *Teman Bahasaku*.

The platform was designed as a Web-based interactive learning medium. This format was selected

because digital applications can combine multiple forms of learning resources, including written text, audio, visual materials, video, animations, and interactive activities. The design therefore sought to create a learning environment that was engaging, contextual, interactive, and appropriate for the characteristics of elementary school students.

The design process included the development of the overall structure and navigation of the application. Particular attention was given to the organization of content, the user interface, the sequence of learning activities, multimedia components, and the evaluation system. The platform was designed to contain three principal sections.

The first section was an introductory section, which included the main page, user instructions, navigation menus, and relevant curriculum information, including the CP and TP. This section was intended to provide users with an accessible orientation to the learning environment and to facilitate navigation through the application.

The second section was the core learning-content section. This component contained learning materials and activities designed to address listening, speaking, reading, and writing. The activities were structured to support the integrated use of language skills while also providing opportunities for creative thinking. Multimedia elements were incorporated to provide varied learning stimuli and to support interactive engagement with the content.

The third section was a concluding and evaluation section, which included evaluation activities, a glossary, bibliography, and developer profile. This section was intended to support the completion of learning activities and provide additional reference information.

During the Design stage, a storyboard was developed to describe the sequence and organization of the application's content and features. The user interface was also designed to determine the visual arrangement and interaction flow of the platform. In addition, the researchers developed instruments for expert validation, product practicality assessment, and the assessment of students' language skills and creative thinking. These instruments were prepared to ensure that the subsequent development and evaluation processes were aligned with the objectives of the study. The Design stage therefore functioned as the bridge between the identified educational problems and the technical realization of the learning medium. The instructional components, multimedia features, learning activities, and evaluation procedures were organized before the initial prototype was developed.

2.5 Development of the *Teman Bahasaku*

The third stage was the Develop stage, which aimed to produce an initial prototype of *Teman Bahasaku*! based on the specifications established during the Define and Design stages. The development process involved the integration of learning materials, student activities, multimedia elements, interface designs, navigation systems, and evaluation components into a functioning digital application. The prototype was developed as an integrated learning environment for Indonesian language learning. The instructional content was organized to provide students with opportunities to engage in activities related to listening, speaking, reading, and writing. These activities were connected with learning tasks intended to encourage students to explore information, express ideas, consider different possibilities, and produce language-based outputs.

The development of the prototype was therefore guided by the principle that language skills should not be developed solely through isolated technical exercises. Instead, the platform was designed to provide a more interactive learning experience in which students could use different language skills as part of connected learning activities. The integration of multimedia elements was also intended to support students' engagement with the learning materials. Following the development of the initial prototype, the product was prepared for preliminary expert appraisal. At this stage, the prototype

constituted the first version of *Teman Bahasaku*! to be evaluated in terms of its instructional appropriateness, content quality, media characteristics, and ability to support the intended learning objectives.

2.6 Expert Validation and Preliminary Product Revision

The initial prototype of *Teman Bahasaku*! underwent an expert validation process. The purpose of this stage was to assess the preliminary appropriateness of the developed product before broader implementation or effectiveness testing. The validation involved three areas of expertise: Indonesian language content, learning media, and creativity. The Indonesian language expert evaluated the appropriateness and quality of the learning materials. The assessment included the relevance of the content to Indonesian language learning, the appropriateness of the integration of listening, speaking, reading, and writing, and the relationship between the learning activities and the intended development of students' competencies.

The media expert evaluated the technical and visual characteristics of the application. The assessment focused on aspects such as visual presentation, navigation, interactivity, usability, and other technical features relevant to the quality of the digital medium. This evaluation was important because a pedagogically appropriate product must also be accessible and usable by its intended users. The creativity expert evaluated the extent to which the learning activities and media design were appropriate for stimulating creative thinking. The assessment considered whether the platform provided opportunities for students to explore ideas, generate alternatives, and develop original language-based responses. The expert validation process used a structured questionnaire. The assessment covered aspects of appearance, navigation, content, language, interactivity, learning suitability, and the platform's capacity to support creative thinking. The results of the validation were then used as the basis for revising the initial prototype. Product revision was therefore an integral component of the development process. Feedback obtained from the experts was used to identify aspects of the platform requiring improvement. The purpose of revision was to improve the quality and appropriateness of the initial product before subsequent testing.

It should be emphasized that the present study was limited to the stages of needs analysis, initial product design and development, and preliminary expert validation. Although the broader 4D framework includes dissemination, the present study did not proceed to the dissemination stage. Therefore, the findings should be interpreted as evidence of preliminary product development and expert-based validation rather than as definitive evidence of large-scale implementation or effectiveness.

2.7 Data Collection Procedures

Data collection was conducted at two principal stages: the needs analysis stage and the expert validation stage. During the needs analysis stage, data were collected using an online questionnaire. The questionnaire was designed to obtain information concerning the current condition of Indonesian language learning, the use of educational media, learning barriers, feature requirements, and the perceived need to develop students' language skills and creative thinking. Questionnaire items for AI-based digital attendance were developed from previous studies on AI-supported attendance and digital monitoring [16], while QR Code-based attendance indicators were based on studies of its implementation, efficiency, accessibility, and accuracy [21]–[25]. Teacher work discipline indicators were derived from the concepts of professional responsibility, organizational rules, punctuality, and professional behavior [5][6].

Data were collected using a structured questionnaire consisting of three sections corresponding to the research variables. All items used a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Before the main data collection, the instrument underwent validity and reliabil-

ity testing. Invalid items were excluded, so the final instrument consisted only of valid and reliable items representing the conceptual dimensions of each variable. The needs analysis questionnaire focused particularly on the requirements for a learning medium that could support Indonesian language learning more interactively. The information obtained was used to identify the characteristics and features required in the development of *Teman Bahasaku*. The results also informed the instructional design and the selection of activities to be incorporated into the platform. During the expert validation stage, a separate validation questionnaire was administered to the three validators. The validation instrument assessed the suitability of the developed product according to the respective areas of expertise. The assessment covered the quality of the content, language, appearance, navigation, interactivity, learning suitability, and support for creative thinking. The use of separate needs analysis and validation procedures allowed the study to obtain information at different stages of product development. The needs analysis informed the design of the product, whereas the validation process evaluated the preliminary appropriateness of the product after its development.

2.8 Data Analysis

The data obtained from the needs analysis and expert validation were analyzed using descriptive statistics. The analysis focused on frequency, percentage, and mean values to provide a systematic description of the respondents' perspectives. For the needs analysis, questionnaire responses were summarized using frequencies and percentages. This analysis was used to describe respondent characteristics and to identify patterns concerning Indonesian language learning needs, the use of educational media, and the requirements for a digital platform designed to support language skills and creative thinking. For the expert validation, the assessment scores were converted into percentages and mean values. The results were then interpreted according to the established suitability criteria for the developed media. The analysis considered the assessments provided by the Indonesian language expert, media expert, and creativity expert. Descriptive analysis was considered appropriate because the purpose of the study at this stage was to provide an overview of the identified learning needs and the preliminary suitability of the *Teman Bahasaku*! prototype. The analysis therefore did not aim to test causal relationships or establish large-scale effectiveness. Instead, it was used to determine whether the developed product was sufficiently appropriate to proceed to subsequent stages of refinement and testing.

Overall, the methodological procedure followed a chronological sequence from problem and needs identification, instructional analysis, product design, prototype development, expert validation, and product revision. This sequence ensured that the development of *Teman Bahasaku* was grounded in identified learning needs and was subsequently subjected to preliminary expert appraisal before broader implementation. The resulting product was designed as an integrated digital learning medium intended to support the development of listening, speaking, reading, writing, and creative thinking among fourth-grade elementary school students.

3. Results and Discussion

3.1 Results

3.1.1 The Need for *Teman Bahasaku* as an Interactive Indonesian Language Learning Medium

Analysis of the need for the *Teman Bahasaku* media in improving students' language skills and creative thinking in the Indonesian Language subject. The first step taken by the researcher in the initial product development phase was to conduct a needs analysis among educators at Khadijah Wonorejo Elementary School. Data collection was carried out by administering a questionnaire focused on the real challenges faced by teachers, particularly in teaching Indonesian in fourth grade. The results of this needs analysis identified several key issues in the field that require immediate

attention. The following is a presentation of the results of the needs analysis survey administered to teachers at Khadijah Wonorejo Elementary School.

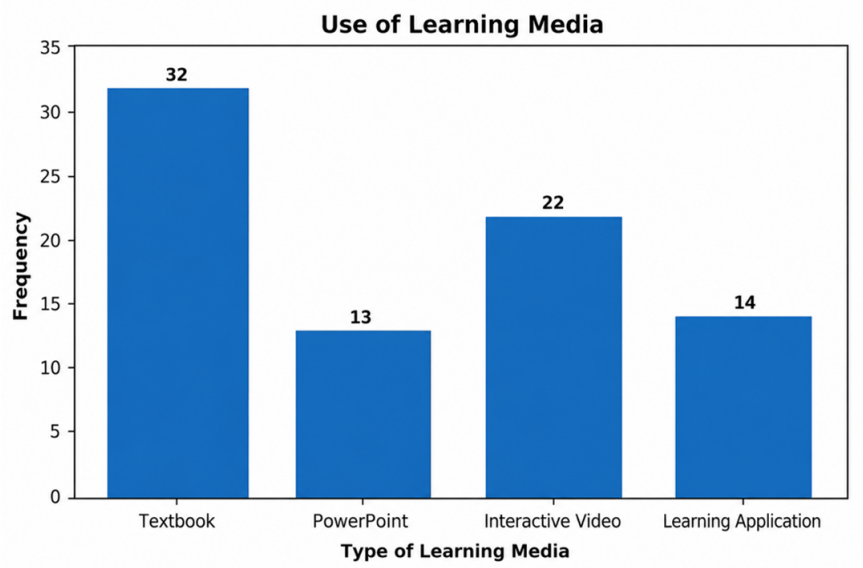

Figure 3. Results of the Needs Analysis

Based on Figure 3, the Use of Learning Media bar chart indicates that respondents still rely more heavily on conventional learning media than on digital media. The results show that textbooks are the most widely used medium, with 32 respondents (80%) out of a total of 41 respondents. This finding indicates that textbooks remain the primary learning resource because they are easily accessible, aligned with the curriculum, and already available in most schools. However, the dominance of textbooks also suggests that the use of more innovative learning media has not yet been fully optimized. The second most commonly used medium was interactive videos, utilized by 22 respondents (55%). The high usage of interactive videos suggests a trend among teachers toward integrating digital media to enhance student motivation. Interactive videos are considered capable of presenting material in a more engaging, visual, and contextual manner, thereby helping students understand abstract concepts.

Meanwhile, learning apps were used by 14 respondents (35%), slightly higher than PowerPoint, which was used by 13 respondents (32.5%). These percentages indicate that the use of digital learning apps is beginning to grow, though their implementation remains limited. The low usage of learning apps may be due to limitations in teachers' digital competencies, school technology infrastructure, or uneven internet access. On the other hand, PowerPoint—which has long been the standard presentation tool—has not yet become the primary choice, likely because teachers prefer more interactive media such as videos. Overall, these results indicate that textbooks still dominate the learning process, while digital media—particularly interactive videos and learning apps—are beginning to be used as supplementary tools. This situation indicates that the digital learning transformation is underway but has not yet fully replaced conventional media. Therefore, efforts are needed to enhance teachers' competencies in developing and utilizing technology-based learning media so that the learning process becomes more innovative, interactive, and aligned with students' needs in the digital age.

Figure 4. Results of the Analysis of Language Skill Needs

3.1.2 Language Skills, Obstacles, and Multimedia and Most Enjoyable Activities

Based on Figure 4, the bar labeled Language Skills That Need to Be Improved shows that teachers believe all language skills still require attention, though there are differences in priority levels across each aspect. The results indicate that speaking skills were the most frequently selected aspect to be improved, with 27 respondents (67.5%) choosing this option. This finding indicates that students still face difficulties in expressing ideas, sharing opinions, engaging in discussions, and giving oral presentations. Therefore, teaching strategies are needed that provide students with more opportunities to practice communication, such as group discussions, presentations, role-playing, and project-based learning. The skill ranked second is reading, with 24 respondents (60%). This percentage indicates that students' reading literacy skills still need to be supported, particularly in understanding the content of texts, identifying key information, drawing conclusions, and developing critical thinking skills through reading activities. Next, listening skills were selected by 19 respondents (47.5%).

The results above show that nearly half of the respondents believe students' ability to understand information conveyed orally still needs to be strengthened. Listening skills form the foundation for the development of other language skills because they are related to the ability to understand instructions, grasp information, and respond appropriately to communication. Meanwhile, writing skills were selected by 17 respondents (42.5%), making it the aspect with the lowest frequency. Nevertheless, this percentage still indicates that writing skills require attention, particularly in developing ideas, constructing effective sentences, and producing coherent writing that adheres to language conventions.

Overall, these results indicate that the priority for developing students' language skills lies in speaking and reading, followed by listening and writing. These findings suggest that the development of learning media—particularly interactive digital media—should be designed to facilitate more active oral communication and reading literacy activities. Thus, the media developed are expected to support student engagement, strengthen language skills comprehensively, and support more effective Indonesian language learning in elementary schools.

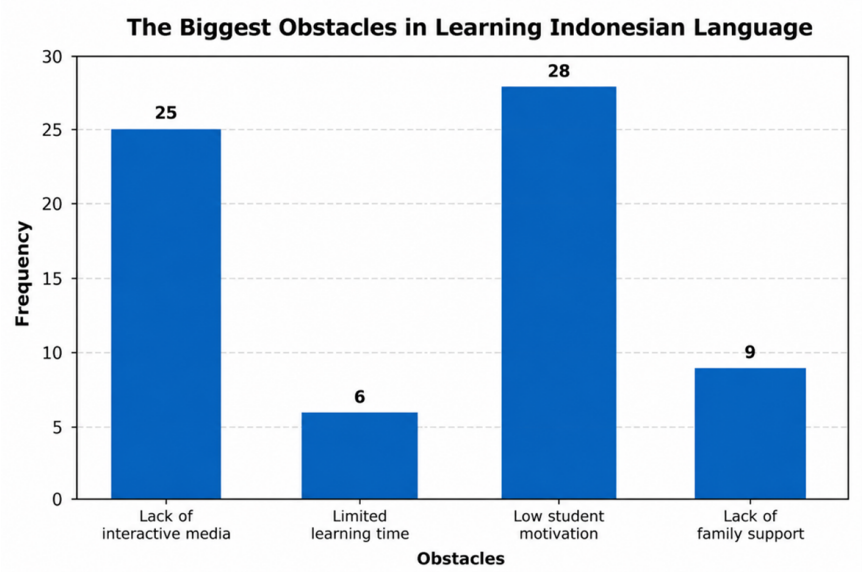

Figure 5. Analysis Results: The Greatest Obstacles

Based on Figure 5, the bar chart titled "Major Obstacles in Indonesian Language Learning," it can be seen that there are two main obstacles most frequently cited by teachers: low student motivation and unengaging learning media. Meanwhile, limited class time and a lack of school facilities were considered relatively minor obstacles. The results show that low student motivation is the most dominant obstacle, cited by 28 respondents (70%). This finding indicates that the majority of teachers view students' low interest, enthusiasm, and engagement in Indonesian language learning as the primary challenge. This situation can lead to low student participation during the learning process and suboptimal achievement of language competencies. The next obstacle is the lack of engaging learning media, selected by 25 respondents (62.5%). This high percentage indicates that the learning media currently in use are not yet fully capable of capturing students' attention or creating an interactive learning experience.

These findings underscore the need to develop more innovative digital learning materials—such as interactive videos, educational apps, and Artificial Intelligence (AI)-based multimedia—to make learning more engaging and boost students' motivation. On the other hand, a lack of school facilities was cited by 9 respondents (22.5%), while limited learning time was cited by only 6 respondents (15%). These percentages indicate that constraints related to facilities or time allocation are not the primary factors hindering Indonesian language learning. Thus, learning challenges are more closely related to pedagogical aspects than to infrastructure. Overall, these results indicate that the greatest obstacles in Indonesian language learning lie in student motivation and the quality of the learning media used. Therefore, the development of technology-based interactive learning media is a relevant solution for boosting learning motivation, creating more active learning experiences, and supporting the improvement of students' language skills in elementary school.

Based on Figure 6, the bar chart titled "Most Engaging Learning Media for Students," it is evident that the teachers, as the respondents, perceived that students have a strong preference for interactive and visual learning media. Educational games were the most preferred medium, chosen by 36 respondents (90%), followed by videos, selected by 24 respondents (60%). In contrast, books were chosen by only 2 respondents (5%), while lectures were the least preferred medium, selected by just 1 respondent (2.5%). These results indicate that the majority of students are more interested in media

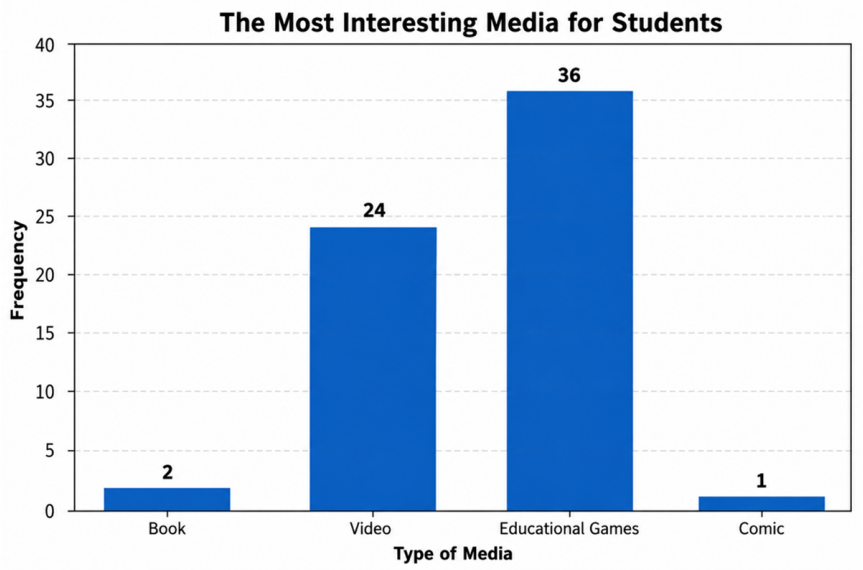

Figure 6. Results of the analysis of the most engaging media

that allow them to actively participate in the learning process. Educational games not only provide an element of entertainment but also enhance student engagement through challenges, immediate feedback, and enjoyable activities. Therefore, this medium is considered the most effective in building learning motivation and sustaining students' attention throughout the learning process.

In addition to educational games, instructional videos also received a fairly high percentage. This indicates that presenting material through a combination of images, animations, sound, and visual illustrations is easier for students to understand compared to conventional media. Videos help students grasp abstract concepts, improve concentration, and provide a more engaging learning experience. Conversely, books and lectures received very low percentages. These findings indicate that learning that relies solely on text or verbal explanations is less effective at capturing students' attention. This aligns with the characteristics of students in the digital age, who prefer interactive, visual learning that provides hands-on experiences. Overall, these results suggest that the development of Indonesian language learning media should focus on educational games and interactive videos. The integration of these two media is believed to enhance learning motivation and student engagement, as well as support the development of language skills more effectively.

Based on Figure 7, the bar chart titled "Features Needed in the '*Teman Bahasaku*' Learning Media," it is evident that the majority of teachers desire learning media that integrates all multimedia features into a single platform. This is indicated by the "All features" option, which received 30 respondents (75%), significantly higher than the options for individual features. This finding indicates that teachers do not need just one type of media, but rather a learning application capable of seamlessly combining videos, animations, and educational games to make the learning process more effective and engaging. Among the individual features, video was the most frequently selected, with 11 respondents (27.5%). Teachers believe that videos can help explain material more concretely through a combination of images, sound, and animation, making it easier for students to understand the concepts being taught. Videos are also seen as capable of increasing students' attention and motivation to learn during the learning process.

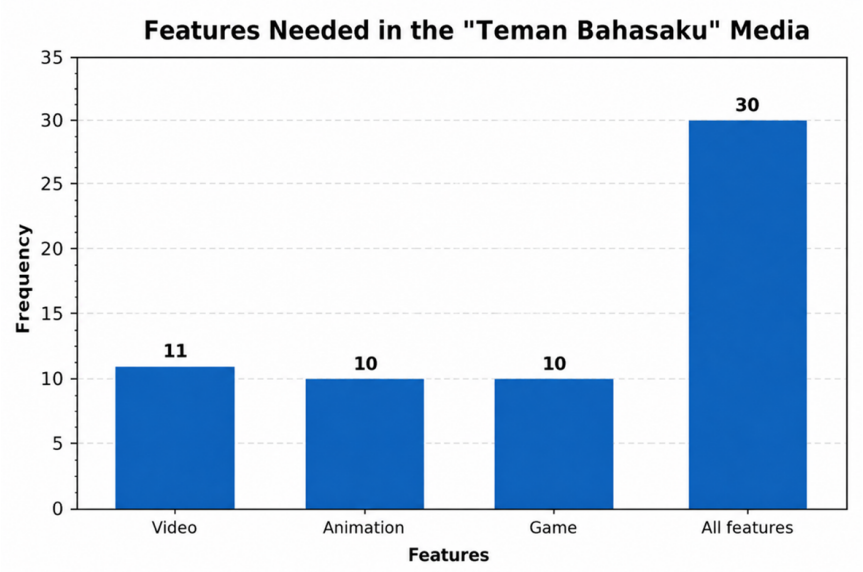

Figure 7. Analysis Results: Features of the "*Teman Bahasaku*" Media

Again, animations and educational games each were received by 10 respondents (25%). These nearly identical percentages indicate that both features are considered equally important. Animations are seen as capable of presenting material in a more engaging and easily understandable way, while educational games provide a fun learning experience while encouraging active student engagement through play-based learning activities. Overall, these results indicate that teachers prefer comprehensive learning media over media that offers only a single type of feature. The integration of videos, animations, and educational games in the "*Teman Bahasaku*" learning media is believed to enhance learning motivation, strengthen conceptual understanding, and develop students' language skills more effectively. These findings also serve as a basis for the conclusion that the development of digital learning media should adopt an interactive multimedia approach, thereby meeting the needs of teachers and the learning characteristics of elementary school students who prefer visual, interactive, and enjoyable learning experiences.

Figure **??**. Results of the analysis of students' most Preferred Activities by the Respondents Based on Figure 6, the bar chart titled "Students' Most Preferred Activities in Indonesian Language Learning," it is evident that the respondents stated that learning through play is the activity most preferred by students. This activity was selected by 41 respondents (100%), indicating that all teachers agree that students are more enthusiastic when learning is presented in the form of games or enjoyable activities. This finding indicates that interactive learning approaches can increase students' interest, motivation, and engagement during the learning process. The second most popular activity is reading, chosen by 10 respondents (25%). This percentage suggests that reading remains a fairly popular activity among some students, especially when presented with engaging reading materials that align with the students' characteristics.

On the contrary, the level of interest in reading remains far below that of gamification-based learning. Next, completing exercises was chosen by 5 respondents (12.5%), while writing was selected by only 3 respondents (7.5%). The low percentages for these two activities indicate, as the respondents perceived, that students tend to dislike learning activities that are monotonous or require high concentration without interactive elements. This situation highlights the need for innovation in the

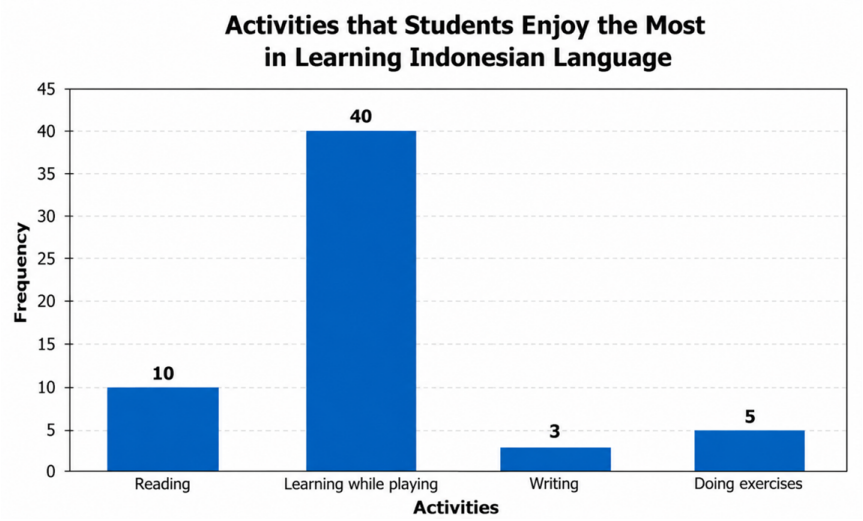

Figure 8. Results of the analysis of students' most Preferred Activities by the Respondents

presentation of exercises and writing activities to make them more engaging—for example, through gamification, interactive challenges, or digital media. Overall, these results indicate that students prefer active, enjoyable learning that involves direct interaction over conventional learning activities. Therefore, the development of the "*Teman Bahasaku*" platform should integrate play-based learning activities—such as educational games, interactive quizzes, simulations, and digital challenges—without neglecting reading, writing, and practice exercises that are presented engagingly. This approach is expected to boost students' motivation to learn while developing their language skills more effectively.

3.1.3 The Feasibility of the *Teman Bahasaku* Web-Based Media in Enhancing the Creative Thinking Skills of Fourth-Grade Elementary School Students

The planning and design phase of the website-based digital learning platform *Teman Bahasaku*—which is intended to improve the four language skills and stimulate creative thinking—includes the development of the platform's design, both in terms of content and visual interface design (UI/UX). The following presents the initial design, blueprint, or storyboard of the *Teman Bahasaku* website, which serves as the foundation for the product in this research and development project:

As shown in Figure 7, the initial design of the homepage interface for the website-based digital learning media product "*Teman Bahasaku*" features an interactive and user-friendly dashboard. This main page is no longer a presentation slide but rather an integrated navigation system that includes various features to comprehensively develop students' language skills and stimulate their creative thinking. As shown in the Main Menu section, there are six activity features provided in this platform, namely: Game Center (interactive language games), Language Correction, Writing Analysis, Learning (containing materials and quizzes), Writing Buddy (an AI-powered writing practice space), and Leaderboard. In this initial design, these six features are grouped and visually organized into an attractive card menu, systematically linked through the website's navigation links. Additionally, the homepage is equipped with gamification elements, such as score tracking (Total XP), activity logs, learning level tracking (such as the "Beginner" level), and collectible badges to motivate fourth-grade students in their learning. For example, if a student clicks the "Learning" menu button, the system will immediately direct the user to a dedicated page containing material explanations and assessments, as shown in the following image. The initial version of the "*Teman Bahasaku*" platform was

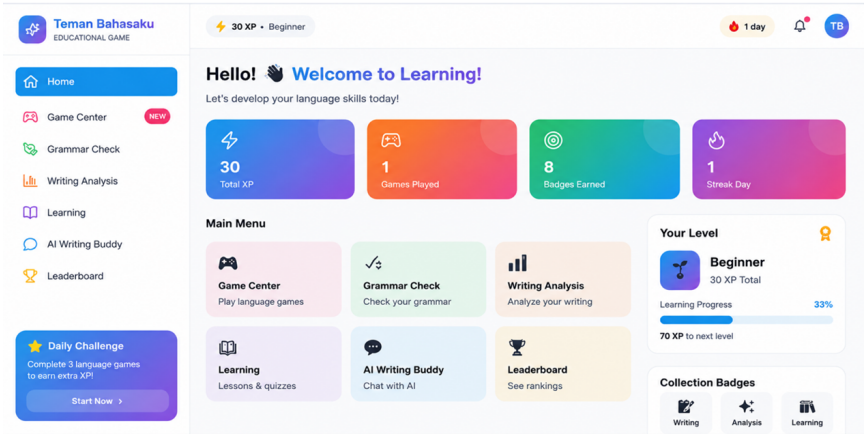

Figure 9. Initial display of the "*Teman Bahasaku*" platform

developed based on a previously established product design. Figure 8 is a screenshot of the initial version of the "*Teman Bahasaku*" Web-based platform.

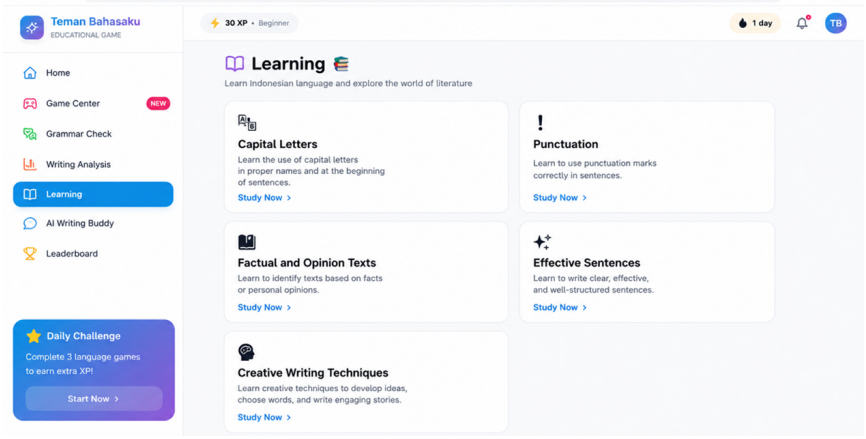

Figure 10. View of the Learning menu

In Figure **??**, in addition to the main dashboard, the website-based digital learning platform "*Teman Bahasaku*" is also designed to include a dedicated "Learning" menu. This menu integrates the presentation of language material with interactive practice exercises (quizzes). According to the instruction "Study the Indonesian language material and try the quiz!", these exercises are specifically designed to evaluate and measure the level of understanding of fourth-grade students after studying the presented subtopics. The learning topics covered include mastery of capital letters, punctuation, standard and non-standard words, effective sentences, and creative writing techniques. Through this menu, students are not only evaluated on their language skills according to the rules but are also trained to apply that understanding independently and creatively. Figure 11 is an early prototype of the user interface for the Learning menu.

In Figure 11, as a way to optimize the gamification approach in learning, the *Teman Bahasaku* website features a main menu called the Game Center. This menu is specifically designed to create an interactive, challenging, and fun (playful learning) experience for fourth-grade students. In line with

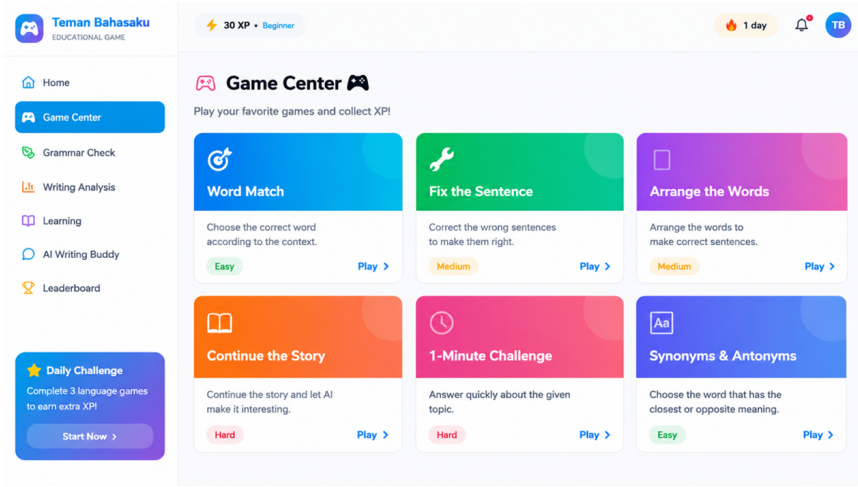

Figure 11. View of the Games menu.

the slogan "Choose your favorite game and collect XP!", this feature aims to motivate students' active engagement through a system that awards Experience Points (XP) every time they complete a challenge. In this interface design, there are six variations of educational language games categorized by difficulty level (Easy, Medium, and Hard), including: a) Guess the Standard Word (Easy): A game to practice correct spelling and vocabulary according to PUEBI guidelines. b) Correct Sentences (Medium): An analytical game in which students are required to identify and correct incorrect sentence structures to form effective sentences, c) Build a Sentence (Intermediate): A language logic exercise involving arranging random words into a coherent and meaningful sentence, d) Continue the Story (Difficult): An advanced game evaluated directly by AI (Artificial Intelligence), in which students are instructed to continue a story's plot. This activity is particularly crucial for stimulating students' imagination and creative thinking skills. e) 1-Minute Challenge (Intermediate): A speed-writing exercise (fluency) on random topics to train quick thinking and creative idea generation within a limited time; f) Synonyms Antonyms (Easy). Basic games to enrich students' vocabulary related to synonyms and antonyms.

Through the variety of games in this Game Center, the platform functions not merely as a medium for delivering content but transforms into an interactive space that comprehensively trains all four language skills while sparking students' creative thinking. Figure 10 is a visual design of the Game Center menu.

Figure 12 shows another flagship innovation developed within the "*Teman Bahasaku*" website: the Teman Menulis feature. This feature integrates artificial intelligence (AI) technology specifically designed to serve as a virtual Indonesian language assistant for students. Featuring an interactive, child-friendly chatbox interface, "Teman Menulis" acts as a personal tutor ready to guide students' learning processes individually and in real time.

As stated in the automated welcome message on the interface design screen, this AI assistant is designed to support fourth-grade students in four main areas, namely: a) Creating stories or writing: Guiding students step by step in organizing an outline and paragraphs; b) Correcting sentences: Providing immediate feedback to correct spelling errors or ineffective sentence structure; c) Providing writing ideas: Stimulating divergent thinking by offering prompts when students face obstacles in finding inspiration (writer's block), d) Explaining grammar: Providing a practical and applicable understanding of Indonesian language rules. The availability of this interactive dialogue space is

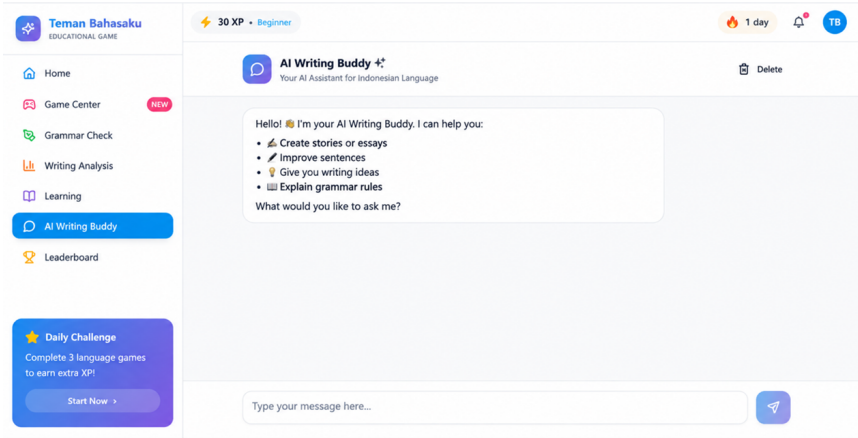

Figure 12. View of the "Writing Buddy" Menu

crucial as a bridge to improving writing skills independently. Through the message box at the bottom of the screen, students are encouraged to actively type and formulate questions, which in turn trains their reasoning skills and facilitates the flow of their creative thinking. Figure 11 is a visual design for the Teman Menulis smart assistant menu.

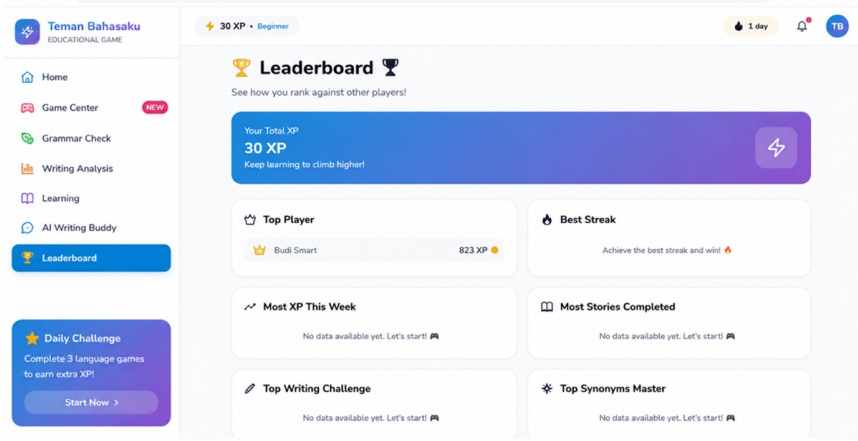

Figure 13. Leaderboard menu display

In Figure 13, as the culmination of the gamification design for the *Teman Bahasaku* learning platform, the final interface developed is the Leaderboard feature. This feature is designed not only as a tool for tracking digital progress but also as a source of extrinsic motivation for fourth-grade students. According to the instruction "See your best scores in each game!", this page presents a transparent and visual summary of students' learning achievements. At the top, there is a "Your Stats" panel that displays accumulated experience points (XP), proficiency level status (such as the "Beginner" level), and the number of games completed.

Furthermore, the interface features metric cards displaying details of students' highest scores for each language activity. For example, students can view their answer accuracy in the "Guess the Standard Word" game (e.g., 8 out of 10 correct), while games they haven't tried yet display the persuasive prompt "No score yet. Let's play!" The inclusion of this integrated achievement tracking

feature is expected to foster a healthy competitive environment, encourage self-regulated learning, and sustain students' persistence in practicing the four language skills and continuously honing their creative thinking. Below is a visual design of the Leaderboard menu.

3.1.4 Product Validation

The next step in this phase is to conduct product validation of the website-based digital learning medium *Teman Bahasaku.* Validation was carried out by submitting the initial product for assessment and evaluation by experts, including subject matter experts, media experts, and creative thinking experts. The primary objective of this validation process was to test the product, assess its quality and suitability, and obtain constructive feedback to refine the product before its implementation with students.

In this study, the product assessment process involved three main expert validators, namely: (1) a media expert validator, responsible for evaluating the technical aspects, layout, and user interface of the "*Teman Bahasaku*" website; (2) a content expert validator, who assesses the relevance of the Indonesian language content to the learning outcomes of fourth-grade students, and (3) a creativity expert validator, who specifically examines the effectiveness of the media and the game activities within it in stimulating students' creative thinking skills.

3.1.5 Preliminary Validation and Feasibility of *Teman Bahasaku*!

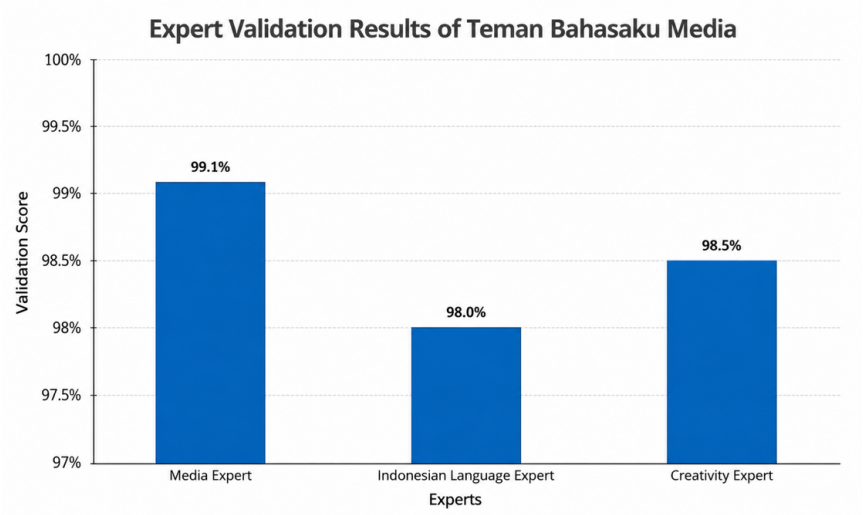

Figure 14. Media Expert Validation Results

Based on the diagram in Figure 14, it shows the results of the *Teman Bahasaku* media expert validation. It also shows that the *Teman Bahasaku* learning media received very high validation scores from all validators. The media expert's rating reached 99%, while the Indonesian language expert and the creativity expert each gave a score of 98%. All scores fell within the 81%–100% range; therefore, based on the criteria for learning media suitability, it falls into the "Highly Suitable" category. The validation results from the media experts obtained the highest score, namely 99% (Highly Suitable). This assessment indicates that the "*Teman Bahasaku*" media has excelled in the aspects of visual design, usability, navigation, interface consistency, multimedia quality, and the application's technical functionality. Thus, the media is deemed ready for use as an educational tool without requiring significant revisions.

Similarly, Indonesian language experts provided a score of 98% (Highly Suitable). This result indicates that the material aligns with learning outcomes, follows correct Indonesian language conventions, has a good level of readability, and suits the characteristics of elementary school students. This assessment indicates that the content meets academic standards and can be used in the learning process. Furthermore, the creativity expert also awarded a score of 98% (Highly Suitable). This assessment indicates that the media exhibits a high level of creativity through videos, animations, illustrations, educational games, and interactive activities that enhance student motivation and engagement in learning. The media is deemed capable of creating an engaging and enjoyable learning experience, making it well-suited to the characteristics of 21st-century learning. Overall, the average validation score from the three validators reached approximately 98.3%, indicating that the *Teman Bahasaku* media falls into the "Highly Recommended" category. These results demonstrate that the media meets the criteria for content, language, presentation, technical quality, and creativity, making it suitable for use as an Indonesian language learning resource in elementary schools.

Table 2. Validation Results from the Experts

Validator	Percentage	Criteria
Media Expert	99%	Highly Reliable
Indonesian Language Expert	98%	Highly Reliable
Creativity Expert	98%	Highly Reliable
Average	**98.3%**	**Highly Reliable**

In Table 2, based on the validation results from three validators, the developed media demonstrated a very high level of suitability. The media expert assigned a suitability rating of 99%, the Indonesian language expert 98%, and the creativity expert 98%. These scores resulted in an overall average of 98.3%, which falls into the "Highly Suitable" category. More specifically, the 99% rating from the media expert indicates that the media has met nearly all aspects related to appearance, design, presentation, navigation, and technical quality. This very high percentage indicates that the media has been well-designed and can be used as a learning support tool. Furthermore, the Indonesian language expert validation score of 98% indicates that the use of language in the media is excellent. The language used was assessed as conforming to linguistic norms, being easy to understand, communicative, and appropriate for the characteristics of the students. However, there is still room for minor improvements in certain aspects, such as the accuracy of word choice, sentence structure, or consistency in the use of terminology.

When dealing with the creativity expert validation, the score was 98%, indicating that the media has successfully incorporated creative elements into the learning process. The media was assessed as engaging, providing space for students to explore, and fostering the emergence of creative ideas and activities. This percentage demonstrates that the creativity aspect has been very well integrated into the developed product. Thus, the average validation score of 98.3%, categorized as "highly suitable," indicates that the product as a whole has met the suitability criteria in terms of media, language, and creativity. The product can be deemed highly suitable for use in learning, with the caveat that minor revisions may still be made based on the validators' suggestions and comments to refine the product's quality before the implementation or pilot testing phase with students.

During the validation process, subject matter experts, media experts, and creative thinking experts provided a number of notes, critiques, and constructive suggestions to refine and improve the quality of the website-based digital learning media "*Teman Bahasaku*." The researchers comprehensively used this feedback as the primary guideline for revising the product. It was this meticulous follow-up on the improvements that ultimately contributed to the high media feasibility scores, both in

terms of the assessment of each indicator and the overall average score. The following outlines several revision notes and improvement suggestions from the subject-matter expert validators that were implemented by the researchers:

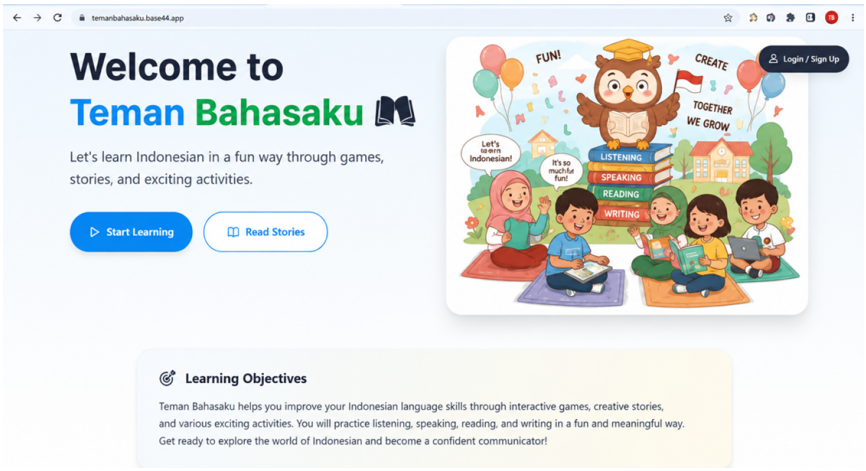

Figure 15. Screenshot of the *Teman Bahasaku* homepage after revision

Figure 15 shows the main page of *Teman Bahasaku*, which features an engaging, interactive, and learner-friendly design for digital learning media. The main section displays the media's identity with the title "Welcome to *Teman Bahasaku*," accompanied by an illustration of children learning together that reinforces its educational and fun nature. The "Start Learning" and "Read Stories" buttons make it easy for users to access learning activities. The "Learning Objectives" section explains the platform's purpose: to improve Indonesian language skills through interactive games, creative stories, and various learning activities. Overall, the interface features simple navigation, an appealing color scheme, and visuals suited to the characteristics of elementary school students.

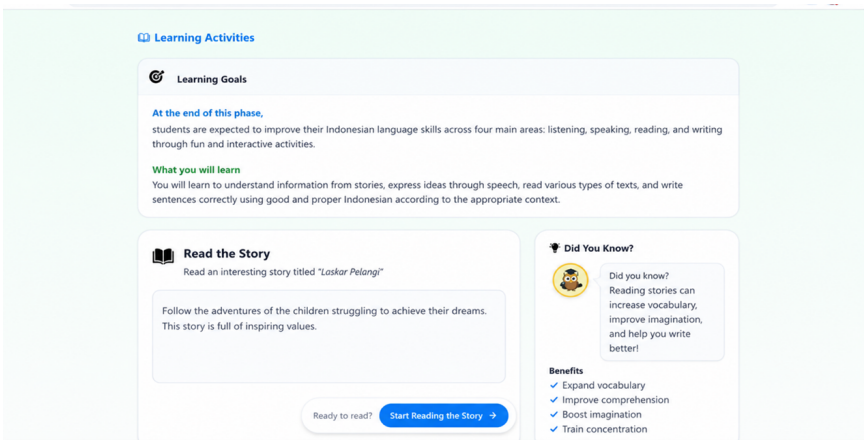

Figure 16. "*Teman Bahasaku*" Learning Activities Interface After Revision

Figure 16, the "Learning Activities" interface, demonstrates a systematic digital learning structure focused on developing Indonesian language skills. The "Learning Goals" section outlines the learning objectives, which include listening, speaking, reading, and writing skills through interactive activities. The "Read the Story" section features the story Laskar Pelangi, designed to enhance com-

prehension and provide a contextual learning experience. Meanwhile, the "Did You Know?" section provides additional information on the benefits of reading, such as expanding vocabulary, improving comprehension, developing imagination, and training concentration. Overall, the interface is simple, informative, easy to navigate, and, as a "," supports engaging language learning for elementary school students

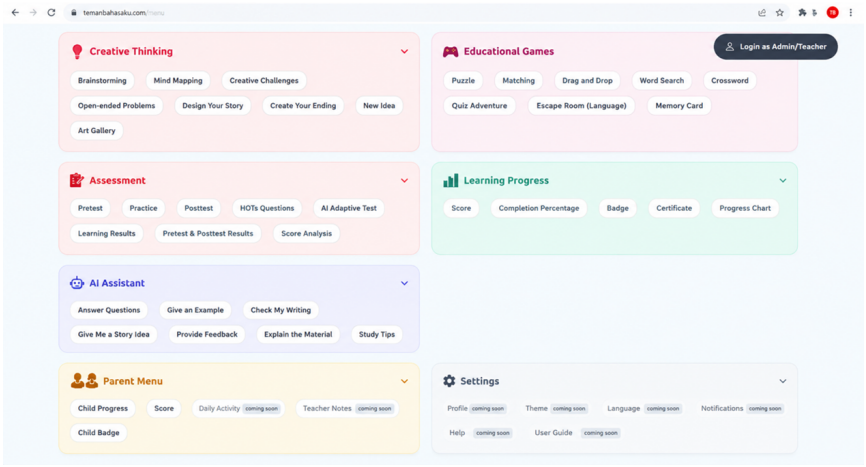

Figure 17. The "*Teman Bahasaku*" main menu interface after revision

Figure 17 the *Teman Bahasaku* main menu, which integrates various learning components into a single digital ecosystem. The Creative Thinking feature offers activities such as brainstorming, mind mapping, creative challenges, open-ended problems, and story creation to foster.

Table 3. Comparison of Previous Digital Media

Previous Digital Media	Main Focus	Language Skills	Creativity	Gamification	AI	Integrated Platform
Study A	Reading	✓	–	–	–	–
Study B	Writing	✓	✓	–	–	–
Study C	Games	✓	✓	✓	–	–
Teman Bahasaku	Integrated language learning	✓	✓	✓	✓	✓

Table 3 compares previous digital media used for language learning with the proposed platform, *Teman Bahasaku*. The comparison is based on the main focus of the media, including language skills, creativity, gamification, artificial intelligence (AI), and an integrated platform. Study A focuses primarily on reading and language skills, while Study B focuses on writing and also incorporates creativity. Study C uses games and includes language skills, creativity, and gamification. In contrast, *Teman Bahasaku* is designed as an integrated language-learning platform that combines all of these aspects. It supports language skills, encourages creativity, incorporates gamification, utilizes AI, and provides an integrated platform for language learning. Therefore, compared with the previous digital media, *Teman Bahasaku* offers a more comprehensive approach by integrating multiple features into a single learning platform.

The first focus of the revision stems from the evaluation results of the subject matter experts. The subject matter experts provided a number of critical notes aimed at ensuring accuracy and improving the quality of the language content within the "*Teman Bahasaku*" app. The following details the

product revision process carried out by the researchers based on the critiques and suggestions from the subject matter experts. In addition, the implications of validation provide new evidence. In Table 3 (see Appendix 1), the validation results show that the "*Teman Bahasaku*" media is deemed suitable for pilot testing with several improvements. Creative thinking experts recommend the development of high-level challenges, open-ended questions, and AI optimization through probing questions to stimulate original ideas. Content experts suggest including learning objectives, a summary of the material, a final assessment, and ensuring the material aligns with the textbook. Media experts emphasize the need for more detailed explanations and the addition of a variety of interactive features that accommodate visual, auditory, and kinesthetic learning styles. Overall, the media was deemed suitable for pilot testing, with revisions primarily needed in the areas of content, creativity, interactivity, and AI optimization.

Product revisions were conducted as a systematic step to improve and refine the prototype of the website-based digital learning media *Teman Bahasaku* developed in this study. Ideally, the revision process should be based on the cumulative feedback from expert validators during the validation test, as well as evaluations from students and educators during the field trial. However, based on the results of data collection and observations during the product trial, neither the students nor the classroom teachers provided any substantial suggestions for improvement. Users generally expressed their satisfaction and assessed that the *Teman Bahasaku* media was already very practical, interactive, and suitable for use in the learning process. Therefore, the discussion in this subsection will focus on the follow-up to the product revision process, which is based on criticism, feedback, and constructive suggestions from the validators (specifically subject matter experts, media experts, and creative thinking experts) during the product validation phase.

3.2 Discussion

3.2.1 The Need for *Teman Bahasaku*! as an Interactive Indonesian Language Learning Medium

The findings indicate that the development of *Teman Bahasaku* is grounded in the actual instructional needs of Indonesian language learning at the elementary school level. The needs analysis with 41 teachers at Khadijah Wonorejo Elementary School revealed that learning media use remains dominated by conventional resources, particularly textbooks, which were used by 32 respondents (80%). Interactive videos were used by 22 respondents (55%), learning applications by 14 respondents (35%), and PowerPoint by 13 respondents (32.5%). These findings indicate a gap between the availability of digital learning technologies and their actual integration into classroom instruction. Although textbooks remain an important instructional resource, the findings suggest a growing need for learning media that are believed to be more interactive, visual, and capable of engaging students in active learning. This finding is consistent with previous research indicating that digital media in elementary Indonesian language learning, including interactive multimedia, educational videos, applications, and digital platforms, can support student motivation, engagement, comprehension, and language development [33].

The identified learning barriers further clarify the rationale for developing the product. Low student motivation was reported by 28 teachers (70%) as the most significant barrier, followed by unengaging learning materials, reported by 25 teachers (62.5%). In contrast, time constraints were identified by only six respondents (15%), while lack of learning resources was reported by nine respondents (22.5%). These findings suggest that the central problem is not simply the availability of technological infrastructure, but the extent to which learning experiences are designed to attract students' attention and encourage active participation. Therefore, the development of *Teman Bahasaku*! responds directly to an instructional problem by integrating games, videos, animations, literacy activities, and AI-supported learning into a single learning environment.

The students' preferences provide further empirical support for this design decision. Educational games were identified by 36 respondents (90%) as the most engaging medium, followed by videos (60%). Books were selected by only 5% of respondents, while lectures were selected by 2.5%. Moreover, all teachers (100%) believed that students most enjoyed learning through play. These findings imply that the required digital medium should not merely convert conventional instructional materials into digital form. Rather, it should provide interaction, challenges, feedback, and enjoyable learning experiences. This interpretation is supported by research showing that gamification can improve students' motivation and engagement. Chen et al. found that gamification in elementary classroom contexts can improve academic performance and emotional dimensions of motivation [34], while Alsadoon et al. reported that gamified learning environments can increase motivation and learning satisfaction, although improvements in academic outcomes cannot automatically be assumed [35]. Similarly, Purwanti and Putra demonstrated the potential of game-based learning to foster creative thinking among elementary school students [36]. Other research also indicates that game elements such as challenges, points, and rewards can contribute to more engaging and meaningful learning experiences [37].

The needs analysis also identified a specific requirement concerning the development of students' Indonesian language skills. Speaking was identified as the skill most in need of improvement, reported by 27 teachers (67.5%), followed by reading (60%), listening (47.5%), and writing (42.5%). This finding has important implications for the design of *Teman Bahasaku*! because Indonesian language learning should provide opportunities for students to actively use language rather than merely receive information. Accordingly, the platform integrates listening, speaking, reading, and writing activities so that students can comprehend information, express ideas orally, interpret texts, construct sentences, develop stories, and produce written work. The integration of these skills strengthens the alignment between the identified instructional needs and the intended function of the developed medium.

3.2.2 Integration of Multimedia, Literacy, and Creative Thinking

The integration of multimedia features in *Teman Bahasaku* is also supported by the needs analysis. Three-quarters of the respondents (75%) expressed a preference for integrating videos, animations, and educational games within a single platform. This finding indicates that teachers require a comprehensive learning environment rather than a collection of disconnected digital resources. Each medium can serve a complementary pedagogical function: videos provide visual and auditory contexts, animations support the visualization of concepts, and games provide opportunities for students to learn through interaction, challenges, and feedback. Previous research on digital media for Indonesian language learning at the elementary level similarly indicates that integrating multimedia and digital technology can produce learning experiences that are more relevant, engaging, and student-centred [38][39].

The reading and storytelling components of *Teman Bahasaku* further strengthen its pedagogical integration. Digital storytelling combines text, images, sound, and narrative progression, thereby creating opportunities for students to engage with language through multiple modes. Previous re-

search has identified digital storytelling as relevant to twenty-first-century education, while Özen and Duran found that digital storytelling activities can support fluency, originality, imagination, and the ability to consider different perspectives [38]. Consequently, storytelling in *Teman Bahasaku*! is not positioned merely as an additional reading activity but as a mechanism for simultaneously supporting literacy and creative development.

Creative thinking constitutes an important dimension of the product because the intended medium is designed not only to develop language proficiency but also to provide opportunities for students to generate, elaborate, and transform ideas. The importance of developing creativity from the elementary level is supported by previous research [27][40]. Leasa et al. emphasize the importance of learning environments that foster creativity, while Sahrul et al. demonstrate the potential of Creative Problem Solving-based learning materials to strengthen elementary students' creative thinking. In addition, Narsiti and Raharja reported improvements in the creative thinking skills of fourth-grade students following the use of animated videos [40][41][42]. These findings provide a pedagogical basis for integrating creative-thinking activities into the Indonesian language learning environment.

The design of *Teman Bahasaku* reflects this orientation through features such as Creative Thinking, Brainstorming, Mind Mapping, Creative Challenges, Open-ended Problems, Design Your Story, and Create Your Ending. These activities provide opportunities for students to generate multiple possible responses rather than being restricted to a single predetermined answer. The integration of such activities is consistent with research indicating that active learning can facilitate imagination and the exploration of alternative solutions [43][44][45][46][47], while Creative Problem Solving-based learning can strengthen students' creative thinking skills [47][48]. Thus, the creative components of *Teman Bahasaku*! represent substantive pedagogical features rather than merely visual or entertainment-oriented additions.

3.2.3 Preliminary Validation and Feasibility of *Teman Bahasaku*

The preliminary validation results indicate that *Teman Bahasaku* has a very high level of feasibility. The overall validation score reached 98.3%, consisting of 99% from media experts, 98% from Indonesian language experts, and 98% from creativity experts. These results indicate that the developed product was considered highly appropriate in terms of its media presentation, content, language, interactivity, and potential to stimulate creativity. Importantly, these findings address the preliminary validation objective of the study by demonstrating that the product has met the initial criteria required for further development and broader implementation.

The product's feasibility is also reflected in its integrated structure. *Teman Bahasaku* incorporates a Game centre, Learning Modules, Language Correction, Writing Analysis, an AI-powered Writing Companion, Leaderboard, Learning Progress tracking, and creative-thinking activities. Therefore, the product functions not simply as a digital repository of Indonesian language materials but as an integrated learning environment in which students can interact with content, perform activities, receive feedback, and monitor their progress. This design corresponds with contemporary perspectives on digital learning environments that view technology as a medium through which learners actively construct learning experiences rather than merely receive instructional content.

The media expert validation score of 99% is particularly relevant to the usability of the product. The interface employs integrated navigation, card-based menus, icons, attractive visual elements, and feature groupings that correspond to different learning activities. Students can access listening, reading, speaking, writing, creative-thinking activities, educational games, assessment, and progress monitoring through a structured interface. Such organization is important for fourth-grade elementary students because unnecessarily complex navigation may become a barrier to effective interaction with digital learning environments. Elementary students also need opportunities to develop the ability to navigate different forms of digital text, including digital stories, websites, and videos [43].

Consequently, the structured interface of *Teman Bahasaku*! can be interpreted as a form of digital-literacy scaffolding that gradually introduces students to learning through a digital environment.

The gamification features provide the feasibility of the product with an additional dimension to The Game Centre, and the Leaderboard incorporates XP points, levels, challenges, game variations, and score tracking. Previous research indicates that gamification platforms can have positive effects on academic achievement and student motivation [44]. However, the pedagogical value of gamification depends on how its elements are connected to instructional objectives. Research suggests that game elements can influence student motivation when appropriately aligned with learning goals [45], while gamification and game-based learning may differ in their effects on motivation and learning outcomes [46]. Therefore, XP points and leaderboards in *Teman Bahasaku*! should not be interpreted solely as mechanisms of competition. They can instead function as feedback mechanisms that make students' learning progress visible [46].

The variety of games included in the platform also reflects a progression in cognitive demands. The games Guess the Standard Word, Correct the Sentence, Build a Sentence, Continue the Story, 1-Minute Challenge, and Synonyms Antonyms provide activities ranging from vocabulary and language-rule recognition to sentence construction and idea generation. This progression creates opportunities to connect basic language knowledge with higher-order cognitive processes. Research by Rahayuningsih et al. indicates that active learning and games can provide elementary students with opportunities to engage in cyclical thinking processes, particularly during preparation and imagination stages. Digital games can therefore be associated not only with enjoyment and academic achievement but also with the development of creative thinking [47].

3.2.4 AI-Supported Writing as a Pedagogical Component

One of the distinctive features of *Teman Bahasaku*! is the integration of an AI-supported writing component, referred to as Writing Buddy (Teman Menulis). The feature is designed to support students in generating ideas, organizing their writing, refining sentences, and understanding language rules. Its inclusion responds to the study's objective of developing a technologically responsive learning medium while maintaining a pedagogical focus on language development.

Previous research suggests that AI-assisted writing can support several aspects of the writing process. ChatGPT-assisted writing instruction has been associated with improvements in writing skills and learning motivation, although concerns remain regarding dependency and contextual accuracy [49]. AI-supported writing has also been associated with students' learning experiences, motivation, cognitive load, and satisfaction. These findings suggest that generative AI may function productively as a support mechanism within writing instruction when its use is appropriately structured.

However, the integration of AI into *Teman Bahasaku* should not be interpreted as an invitation for students to delegate their thinking and writing to an automated system. The literature identifies potential concerns related to dependency, reduced autonomy, and the loss of students' individual writerly voices [42]. For elementary school students in particular, the pedagogical role of AI therefore needs to be carefully constrained. The AI component should function as a thinking companion or scaffold rather than an answer generator.

This principle is reinforced by the validators' recommendation that the AI feature use more probing questions rather than immediately providing answers. For example, instead of completing a student's story, the system can ask questions such as what might happen next, why a character behaves in a particular way, or what alternative ending could be developed. Such prompts can encourage students to generate and evaluate their own ideas. In this way, AI becomes part of the learning process rather than a substitute for the learner's cognitive activity. This approach is particularly important because empirical research concerning the use of generative AI in K–12 education

remains relatively limited compared with research focusing on its potential applications, usage, and productivity [49].

3.2.5 Implications of the Validation Findings for Product Revision

Although the validation score of 98.3% indicates that *Teman Bahasaku*! is highly feasible, the validation results should not be interpreted as evidence that the product is already proven effective in improving students' learning outcomes. The purpose of the present validation stage is to establish the product's preliminary feasibility and appropriateness before wider implementation and effectiveness testing. Thus, the findings provide evidence of product suitability, rather than conclusive evidence of instructional effectiveness.

The expert feedback provides important directions for subsequent product refinement. The creativity experts recommended increasing the difficulty of Levels 4 and 5 and incorporating more open-ended responses. This recommendation is pedagogically significant because creative-thinking activities should provide sufficient cognitive space for students to explore alternatives, generate original ideas, and solve problems that do not have only one predetermined answer [46][48]. Increasing the complexity of higher levels and expanding open-ended tasks can therefore strengthen the alignment between the product's creative-thinking objectives and its actual learning activities.

Other revision priorities include improving higher-order thinking challenges, optimizing AI prompts, strengthening content explanations, and ensuring greater consistency between learning activities and learning objectives. These revisions are important because technological sophistication alone does not guarantee pedagogical quality. A learning medium becomes educationally meaningful when its technological features are systematically aligned with curricular content, students' developmental characteristics, learning objectives, and opportunities for active cognitive engagement.

3.2.6 Overall Contribution and Novelty of *Teman Bahasaku*

Taken together, the findings demonstrate that *Teman Bahasaku*! was developed in response to a clearly identified instructional need and has achieved a very high level of preliminary feasibility. The product responds to the dominance of conventional learning media, low student motivation, the need for more engaging instructional materials, and the need to strengthen Indonesian language skills, particularly speaking, reading, listening, and writing. It also responds to the identified need for learning experiences that support creative thinking.

The contribution of *Teman Bahasaku*! lies in the integration of these dimensions within a single Web-based learning environment. Rather than presenting games, multimedia, literacy activities, creative-thinking tasks, progress monitoring, and AI-supported writing as separate resources, the product brings them together into an integrated learning ecosystem. This integration is particularly relevant to fourth-grade elementary students because it connects language learning with interaction, creativity, feedback, and digital learning practices.

Therefore, the novelty of *Teman Bahasaku*! can be understood primarily as its pedagogically integrated architecture: Indonesian language skills are combined with game-based learning, multimedia, creative-thinking activities, learning-progress monitoring, and AI-supported writing within one digital medium designed for elementary learners. The validation score of 98.3% provides preliminary evidence that this integrated design is feasible and appropriate for further development. Nevertheless, broader implementation and effectiveness testing remain necessary to determine whether the product provides students with a measurable improvement for their Indonesian language skills, creative thinking, motivation, and other learning outcomes.

In this respect, the findings position *Teman Bahasaku*! as a promising preliminary product rather than a completed intervention with established causal effectiveness. The next stage of research should therefore move beyond expert validation toward implementation with fourth-grade students, followed by systematic evaluation of usability, engagement, learning processes, and learning outcomes. Such subsequent testing will provide stronger empirical evidence concerning the effectiveness of the platform and will determine the extent to which its integrated technological and pedagogical design can contribute to Indonesian language learning in elementary schools.

4. Conclusion

This study developed and conducted a preliminary validation of *Teman Bahasaku*, a web-based interactive learning medium for fourth-grade elementary school students, by their teachers in Indonesian language learning. The product was developed in response to identified instructional needs, particularly the continued dominance of conventional learning media, low student motivation, and the need for more engaging activities to support listening, speaking, reading, and writing skills. *Teman Bahasaku* integrates multimedia, educational games, literacy and storytelling activities, creative-thinking tasks, learning-progress monitoring, and AI-supported writing within a single learning environment.

The preliminary validation results showed a very high level of feasibility, with an overall score of 98.3%, indicating that the product was considered appropriate in terms of media, content, language, interactivity, and its potential to support creative thinking. However, these findings demonstrate preliminary feasibility rather than proven effectiveness. Therefore, *Teman Bahasaku* can be considered a promising learning medium for further development and implementation, while additional testing with fourth-grade students is necessary to determine its actual effects on Indonesian language skills, creative thinking, motivation, and other learning outcomes.

4.1 Implications

The findings have pedagogical and practical implications for Indonesian language learning in elementary schools. The development of *Teman Bahasaku*! demonstrates the potential of integrating the four language skills with multimedia, gamification, creative-thinking activities, and AI-supported writing within a single digital learning environment. This integrated approach may provide teachers with an alternative medium for creating more interactive, student-centred, and engaging learning experiences while encouraging students to actively construct ideas and use language in meaningful contexts. The findings also imply that the use of AI in elementary education should be carefully designed. In *Teman Bahasaku*, AI is more appropriately positioned as a thinking companion or scaffold rather than an answer generator. The use of probing questions and guided feedback may help students develop ideas and improve their writing while maintaining their autonomy and individual voice. For that reason, the educational value of the platform depends not only on technological features but also on their alignment with learning objectives, students' developmental characteristics, and meaningful cognitive engagement.

4.2 Limitations

This study was limited to the development and preliminary expert validation of *Teman Bahasaku*! Although the validation results indicated a very high level of feasibility, the study did not yet examine the product through large-scale implementation or experimental effectiveness testing involving fourth-grade students. Consequently, the findings cannot yet establish whether the platform significantly improves students' Indonesian language skills, creative thinking, motivation, or other learning outcomes.

In addition, the product still requires further refinement based on expert feedback, particularly regarding the difficulty of higher levels, the expansion of open-ended and higher-order thinking activities, the optimization of AI prompts, and the consistency between learning activities and instructional objectives. Therefore, the present findings should be interpreted as evidence of the product's initial suitability and potential rather than conclusive evidence of its educational effectiveness.

4.3 Suggestions for Related Stakeholders and Future Research

Teachers and schools may consider using *Teman Bahasaku* as a complementary learning medium after further refinement and classroom testing. Teachers should integrate the platform with clear learning objectives and provide appropriate guidance, particularly when students use gamification and AI-supported writing features. Schools and educational stakeholders can support its implementation by providing adequate digital infrastructure, teacher training, and supervision to ensure that technology is used to promote active learning rather than merely replace conventional instruction. Future research should involve direct trials with fourth-grade elementary school students to examine the usability, engagement, learning processes, and effectiveness of *Teman Bahasaku*! Larger-scale studies using experimental or quasi-experimental designs are recommended to measure its effects on listening, speaking, reading, writing, creative thinking, and learning motivation. Future studies may also investigate the long-term use of the AI-supported writing component, including its potential benefits and risks related to student autonomy, dependency, and the development of students' individual writing abilities.

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