

DEVELOPMENT OF PBL BASED STUDENT WORKSHEETS INTEGRATING LOCAL WISDOM FOR INTEGRATED IPAS LEARNING IN ELEMENTARY SCHOOLS

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Abstrak

Penelitian ini bertujuan untuk mengembangkan Lembar Kerja Peserta Didik berbasis Problem Based Learning bermuatan kearifan lokal Tegal pada pembelajaran Ilmu Pengetahuan Alam dan Sosial di Sekolah Dasar serta menguji validitas, kepraktisan, dan efektivitasnya. Penelitian ini menggunakan metode Research and Development (R&D) dengan model ADDIE yang meliputi tahap analisis, desain, pengembangan, implementasi, dan evaluasi. Subjek penelitian terdiri atas 20 peserta didik kelas V SD Negeri Pasurungan Lor Kota Tegal. Teknik pengumpulan data menggunakan observasi, angket, wawancara, serta tes hasil belajar berupa pretest dan posttest. Analisis data dilakukan secara deskriptif kuantitatif dan inferensial menggunakan uji t berpasangan. Hasil penelitian menunjukkan bahwa LKPD yang dikembangkan memperoleh tingkat validitas sebesar 92,4% dengan kategori sangat valid dan tingkat kepraktisan sebesar 89,6% dengan kategori sangat praktis. Hasil uji efektivitas menunjukkan adanya peningkatan hasil belajar yang signifikan, ditunjukkan oleh rata-rata nilai pretest sebesar 68,15 dan posttest sebesar 84,32 dengan tingkat ketuntasan belajar mencapai 82%. Hasil uji paired sample t-test menunjukkan nilai signifikansi sebesar 0,000 ($p < 0,05$), sehingga LKPD berbasis PBL bermuatan kearifan lokal Tegal dinyatakan efektif dalam meningkatkan hasil belajar IPAS peserta didik sekolah dasar.

Kata Kunci: LKPD, PBL, Kearifan Lokal Tegal, IPAS, Sekolah Dasar.

Abstract

This study aimed to develop a Problem Based Learning student worksheet integrated with Tegal local wisdom in Science and Social Studies IPAS learning at the elementary school level and to examine its validity, practicality, and effectiveness. This research employed a Research and Development approach using the ADDIE model, consisting of analysis, design, development, implementation, and evaluation stages. The research subjects were 22 fifth-grade students of SD Negeri Pasurungan Lor, Tegal City. Data were collected through observation, questionnaires, interviews, and learning achievement tests consisting of pretest and posttest instruments. Data analysis was conducted using descriptive quantitative and inferential statistics through paired sample t-test analysis. The findings indicated that the developed worksheet achieved a validity score of 92.4% categorized as highly valid and a practicality score of 89.6% categorized as highly practical. The effectiveness test demonstrated a significant improvement in students' learning outcomes, as reflected by the increase in the average pretest score from 68.15 to the average posttest score of 84.32, with a learning mastery achievement of 82%. The paired sample t-test yielded a significance value of 0.000 ($p < 0.05$), indicating that the PBL-based worksheet integrated with Tegal local wisdom was effective in improving elementary students' learning outcomes in IPAS learning.

Keywords: Student Worksheet, PBL, Tegal Local Wisdom, IPAS, Elementary School.

Introduction

Primary education plays a strategic role in fostering students competencies, character, and higher-order thinking skills, providing them with the essential foundation to address the challenges of the twenty-first century. The implementation of the Merdeka Curriculum requires a transformation of instructional practices that extends beyond the mere acquisition of knowledge, emphasizing the development of critical thinking, creativity, collaboration, communication, and problem-solving skills in authentic real-world contexts. At the elementary school level, Natural and Social Sciences (IPAS) serves as an integrated subject designed to enhance students literacy, numeracy, and character development through meaningful and experiential learning activities (Paratiwi & Ramadhan, 2023).

Nevertheless, numerous studies have reported that the implementation of Natural and Social Sciences (IPAS) instruction in elementary schools continues to face several challenges. Learning activities remain predominantly teacher-centered, instructional materials are often insufficiently contextualized, and students active engagement in the learning process is relatively limited. These conditions hinder the optimal development of students critical thinking, problem-solving abilities, and overall learning outcomes. Furthermore, the instructional materials commonly used in elementary schools have yet to effectively incorporate local environmental and cultural resources as contextual learning materials that are relevant to students everyday experiences (Hidayat et al., 2025).

One potential strategy for addressing these learning challenges is to develop Student Worksheets (LKPD) that are designed in accordance with students characteristics, curriculum learning outcomes, and the potential of the local environment as a contextual learning resource (Artini et al., 2023). Beyond serving merely as a medium for presenting learning tasks, LKPD functions as an instructional tool that facilitates students in constructing their understanding through observation, exploration, discussion, investigation, and problem-solving activities conducted independently or collaboratively. Therefore, the development of LKPD should prioritize the principles of validity, practicality, and effectiveness to ensure its suitability for classroom implementation and its capacity to enhance both the quality of the learning process and students learning outcomes (Wahyuni & Zulyusri, 2023). One of the instructional models that can be effectively integrated into the development of Student Worksheets is Problem-Based Learning (PBL). This instructional approach employs authentic, contextual problems as the starting point for learning, encouraging students to engage in inquiry, critical analysis, collaboration, and the development of appropriate solutions to the issues encountered. A growing body of empirical research has demonstrated that the implementation of Problem-Based Learning significantly enhances students' critical thinking skills, creativity, learning engagement, and academic achievement across various educational levels (D. N. I. Sari et al., 2022).

In the context of elementary education, the integration of local wisdom into the teaching and learning process has become an important aspect that deserves greater attention. Local wisdom encompasses the values, traditions, cultural heritage, indigenous knowledge, and community practices that have been passed down from generation to generation and possess significant potential as contextual learning resources. Integrating local wisdom into classroom instruction enables students to develop a deeper understanding of scientific concepts through learning experiences that are closely connected to their everyday lives while simultaneously fostering a sense of appreciation and pride in their local cultural heritage (Verawati & Wahyudi, 2024). Moreover, the incorporation of local wisdom is consistent with the implementation of the Merdeka Curriculum, which emphasizes strengthening the Pancasila Student Profile as one of the primary goals of education (Suprpto et al., 2021).

The City of Tegal possesses a wide range of local wisdom that can be effectively

integrated into Natural and Social Sciences (IPAS) learning. These include the Sedekah Laut (Sea Thanksgiving) tradition, the cultural practices of coastal communities, fisheries processing activities, traditional local cuisine, coastal environmental resources, and the economic activities of local residents. These local assets provide authentic learning contexts that enable students to develop a more concrete and meaningful understanding of IPAS concepts. Furthermore, integrating local wisdom into the learning process not only enhances students' conceptual understanding but also cultivates positive character by fostering appreciation for their cultural heritage and the surrounding environment (Pramudianto et al., 2024).

A number of previous studies have developed Problem-Based Learning (PBL)-based Student Worksheets (LKPD) across various subjects and educational levels. Studies consistently report that PBL-based LKPD demonstrate high levels of validity, practicality, and effectiveness, contributing positively to students' learning outcomes and higher-order thinking skills (Hairida et al., 2020). Furthermore, several researchers have integrated local wisdom into LKPD development and found that contextual learning materials can enhance students engagement and meaningful learning experiences. Studies that specifically develop PBL-based LKPD incorporating Tegal local wisdom within elementary school IPAS learning remain scarce. Existing research predominantly focuses on the implementation of the PBL approach or the integration of local wisdom from other regions, leaving the educational potential of Tegal's local culture in IPAS learning largely unexplored (Puspita et al., 2024).

Based on a preliminary classroom observation conducted at SD Negeri Pasurungan Lor, Tegal City, Natural and Social Sciences (IPAS) instruction was found to rely predominantly on textbooks and conventional worksheet-based activities. As a result, students experienced difficulties in relating the learning content to their surrounding environment, which contributed to low levels of active participation during the learning process. Furthermore, the results of the initial assessment revealed that students' average learning achievement remained at a moderate level, with a mean score of 68. These findings highlight the need to develop innovative instructional materials that can enhance both student engagement and learning outcomes.

Based on the foregoing discussion, this study aims to develop a Problem-Based Learning (PBL)-based Student Worksheet incorporating the local wisdom of Tegal for Natural and Social Sciences (IPAS) instruction in elementary schools and to evaluate the validity, practicality, and effectiveness of the developed product. The novelty of this study lies in the integration of the Problem-Based Learning model with the local wisdom of Tegal City into elementary school IPAS instruction, with the objective of creating a contextual, meaningful, and student-centered learning resource that aligns with the characteristics of elementary learners and the educational principles promoted by the Merdeka Curriculum. It is expected that the findings of this study will provide both theoretical and practical contributions to the development of innovative instructional materials while offering an effective learning alternative for enhancing students' engagement, critical thinking skills, and learning outcomes in elementary education.

Methodology

This study employed a Research and Development (R&D) approach to develop a Problem-Based Learning based Student Worksheet incorporating local wisdom for Natural and Social Sciences (IPAS) instruction in elementary schools. The development process followed the ADDIE instructional design model proposed by Branch, which consists of five sequential phases: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). The ADDIE model was selected because it provides a systematic, structured, and flexible framework for developing instructional materials that are responsive to students needs,

curriculum requirements, and the characteristics of the learning context (Cahyadi, 2019). This research was conducted at SD Negeri Pesurungan Lor 2, Tegal City, Indonesia, with the primary objective of developing an LKPD that integrates the Problem-Based Learning model with the local wisdom of Tegal to promote more contextual, meaningful, and student-centered learning in Natural and Social Sciences (IPAS).

The analysis phase represents the initial stage of the ADDIE model and aims to identify instructional needs as the foundation for product development. During this phase, classroom observations were conducted at SD Negeri Pesurungan Lor 2, Tegal City, Indonesia, accompanied by interviews with fifth-grade teachers and an analysis of instructional documents, including learning outcomes, learning objectives, teaching materials, and students' characteristics. Furthermore, the needs analysis focused on identifying key challenges in Natural and Social Sciences (IPAS) instruction, such as students' low levels of active participation, the limited use of contextual Student Worksheets, and the underutilization of Tegal's local wisdom as a contextual learning resource. The findings of the needs analysis served as the basis for designing instructional materials that are aligned with students' characteristics, curriculum requirements, and the learning environment, thereby ensuring that the developed LKPD addresses the identified instructional needs effectively (Harlinda & Suratmi, 2024).

The design phase focused on developing the blueprint of the Student Worksheet by integrating the instructional syntax of the Problem-Based Learning (PBL) model with elements of Tegal's local wisdom. During this stage, the overall structure of the LKPD, the alignment of learning objectives, the design of learning activities, the preparation of visual illustrations, the development of assessment instruments, and the layout of the instructional materials were systematically planned. The learning content was developed by incorporating environmental phenomena and local cultural contexts, enabling students to relate Natural and Social Sciences (IPAS) concepts to authentic situations encountered in their daily lives. This design process ensured that the developed LKPD not only fulfilled curriculum requirements but also promoted contextual, meaningful, and student-centered learning experiences (Adeoye et al., 2024).

During the development phase, the initial LKPD prototype was produced based on the instructional design developed in the previous stage (Mohamed et al., 2025). The prototype subsequently underwent expert validation involving specialists in subject matter, instructional media, and language to evaluate the appropriateness of the content, linguistic quality, visual design, organization of learning materials, and the implementation of the Problem-Based Learning (PBL) syntax. Feedback and recommendations provided by the validators were systematically incorporated to revise and refine the product before it was implemented in the classroom (Shakeel et al., 2023). This iterative validation process ensured that the developed LKPD met the required standards of instructional quality and usability prior to field testing.

The implementation phase involved a limited field trial conducted with 22 fifth-grade students from an elementary school in Tegal City, Indonesia. During this phase, the classroom teacher implemented the learning activities using the developed Student Worksheet (LKPD). Throughout the implementation process, classroom observations were carried out to evaluate the fidelity of the instructional implementation, while data on the practicality of the LKPD were collected through questionnaire responses completed by both the teacher and the participating students. The results obtained from this phase provided empirical evidence regarding the feasibility and practicality of the developed LKPD for use in elementary school Natural and Social Sciences (IPAS) instruction (L. Sari et al., 2020).

The final phase of the ADDIE model was the evaluation stage, which aimed to comprehensively assess the quality of the developed product in terms of its validity, practicality, and effectiveness. Evaluation was conducted continuously through formative

assessment at each stage of the development process, followed by a summative evaluation after the implementation phase had been completed. This comprehensive evaluation process ensured that the final LKPD met the required quality standards and was appropriate for use in Natural and Social Sciences (IPAS) instruction at the elementary school level (Li & Sun, 2024).

The study involved three groups of participants. The validation stage included three experts consisting of a subject-matter expert, a media expert, and a language expert, who evaluated the developed LKPD from their respective areas of expertise. The implementation stage involved one fifth-grade classroom teacher and 22 fifth-grade students from SD Negeri Pasurungan Lor 2, Tegal City, Indonesia. The participants were selected using purposive sampling based on the consideration that the school had implemented the Merdeka Curriculum and possessed characteristics that aligned with the objectives of the study.

The data collected in this study comprised both qualitative and quantitative data. Qualitative data were obtained through classroom observations, teacher interviews, documentation, as well as feedback and recommendations provided by the expert validators throughout the product development process (Arifin et al., 2024). Quantitative data were gathered using expert validation forms, teacher and student response questionnaires, and learning achievement tests consisting of pretests and posttests. The research instruments included: (1) an observation checklist for the needs analysis, (2) a teacher interview guide, (3) validation instruments completed by a subject-matter expert, a media expert, and a language expert, (4) a teacher response questionnaire, (5) a student response questionnaire, and (6) a multiple-choice achievement test developed based on the Grade V Natural and Social Sciences (IPAS) learning outcome indicators (Creswell, 2023). The use of these complementary instruments enabled the collection of comprehensive evidence to evaluate the quality of the developed LKPD in terms of its validity, practicality, and effectiveness.

Data were analyzed using both descriptive and inferential statistical techniques. The data obtained from the expert validation and practicality assessments were analyzed using percentage calculations and subsequently interpreted into five categories: very valid, valid, moderately valid, less valid, and invalid (Sugiyono, 2023).

The effectiveness of the developed LKPD was evaluated by comparing students' pretest and posttest scores. Prior to hypothesis testing, the normality of the data was examined using the Shapiro–Wilk test. Subsequently, differences between pretest and posttest scores were analyzed using a paired-samples t-test at a significance level of 0.05 with the assistance of IBM SPSS Statistics version 23. In addition, the mean scores and standard deviations of both the pretest and posttest were calculated to provide a descriptive overview of students' learning achievement before and after the implementation of the developed LKPD. The developed LKPD was considered effective when the significance value was less than 0.05 and at least 80% of the students achieved the predetermined learning mastery criterion.

Findings and Discussion

This study developed a Problem-Based Learning (PBL)-based Student Worksheet (LKPD) integrated with Tegal local wisdom using the ADDIE development model. The developed product demonstrated high feasibility, with material and media validation scores of 93.8% and 91.0%, respectively, indicating that it met the required standards for elementary classroom implementation. The practicality assessment also showed positive results, achieving an average score of 89.6%, which suggests that both teachers and students found the worksheet easy to use during the learning process. In addition, the effectiveness test revealed a substantial improvement in students' learning achievement, as the mean score increased from 68.15 on the pretest to 84.32 on the posttest, while learning mastery improved from 35.71% to 82.14%. Statistical analysis using the paired-samples t-test confirmed that the improvement was significant ($p < 0.05$).

These findings indicate that integrating Problem-Based Learning with local wisdom provides a more meaningful and contextual learning experience. Students actively engaged in problem-solving activities related to their surrounding environment, allowing them to connect scientific concepts with real-life situations. This learning approach not only improved conceptual understanding but also encouraged collaboration, critical thinking, and active participation throughout the learning process. Therefore, the developed LKPD can be considered an effective instructional resource for supporting student-centered IPAS learning while simultaneously promoting the integration of local cultural values into classroom instruction.

Findings

This study resulted in the development of a Problem-Based Learning (PBL)-based Student Worksheet incorporating local wisdom for Grade V Natural and Social Sciences (IPAS) instruction at SD Negeri Pesurungan Lor 2, Tegal City, Indonesia. The product was developed by following the five phases of the ADDIE instructional design model, namely Analysis, Design, Development, Implementation, and Evaluation. Prior to classroom implementation, the developed LKPD underwent a comprehensive validation process involving subject-matter, media, and language experts to ensure its content accuracy, instructional quality, and linguistic appropriateness.

The validation stage was conducted to determine the feasibility of the developed product (Andres et al., 2023). Based on the experts' evaluations, the developed LKPD obtained an average validity score of 92.4%, which was classified as very valid. This result indicates that the LKPD satisfied the required criteria in terms of content quality, presentation, language, graphical design, and the implementation of the Problem-Based Learning (PBL) syntax, demonstrating its suitability for classroom use. Previous studies have suggested that instructional materials achieving a validity score above 85% are considered highly feasible for implementation, requiring only minor revisions before classroom application. The results of the material expert validation are presented in Table 1.

Table 1. Material Expert Validation Results

Aspects	Percentage (%)	Category
Alignment of the content with Learning Outcomes and Learning Objectives.	95,0	Highly Valid
Concept accuracy.	94,0	Highly Valid
Appropriateness of the Problem-Based Learning (PBL) syntax.	93,0	Highly Valid
Integration of local wisdom.	94,5	Highly Valid
Content presentation.	92,5	Highly Valid
Learning evaluation.	93,8	Highly Valid
Average	93,8	Highly Valid

Source: Research Data, 2026.

The media expert validation was conducted to evaluate the feasibility of the visual appearance, design, and presentation of the developed LKPD, ensuring that the product was not only academically accurate but also visually appealing and user-friendly for both teachers and students. The evaluation was carried out by a university lecturer with expertise in instructional media. The assessment covered several aspects, including cover design, layout, typography, illustration quality, consistency of color usage, readability, ease of use, and the presentation of learning activities. Based on the evaluation results, the developed LKPD obtained a validity score of 91.0%, which was classified as very valid. These findings indicate that the visual and instructional design of the LKPD met the established quality standards and was appropriate for implementation in elementary school learning. The results of the media expert validation are presented in Table 2.

Table 2. Media Expert Validation Results

Aspects	Percentage (%)	Category
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Interface design	92,0	Highly Valid
Layout	90,5	Highly Valid
Typography	90,0	Highly Valid
Illustration quality	92,5	Highly Valid
Ease of use	91,0	Highly Valid
Presentation consistency	90,0	Highly Valid
Average	91,0	Highly Valid

Source: Research Data, 2026.

In addition to its high validity, the developed LKPD also demonstrated a high level of practicality, achieving a score of 89.6%. This finding indicates that the LKPD was easy to use for both teachers and students during the learning process. Teachers reported that the instructional activities were well organized, with the stages of Problem-Based Learning systematically arranged from problem orientation, investigation, and group discussion to reflection. Meanwhile, students showed a high level of enthusiasm because the learning activities were more interactive, engaging, and closely connected to real-life contexts. These findings are consistent with previous studies indicating that the Problem-Based Learning approach promotes students' active participation through collaborative learning and authentic problem-solving activities, thereby enhancing learning engagement (Suparjan et al., 2024). The results of the practicality assessment, based on the teacher and student response questionnaires administered after the implementation of the LKPD, are presented in Table 3.

Table 3. Practicality Test Results

Respondents	Percentage (%)	Category
Teacher	91,8	Highly Practical
Students	87,4	Highly Practical
Average	89,6	Highly Practical

Source: Research Data, 2026.

The effectiveness test was conducted to determine the extent to which the use of a Problem-Based Learning (PBL)-based student worksheet (LKPD) integrated with local wisdom could improve students learning outcomes in Science and Social Studies (IPAS). Effectiveness was assessed by administering a pretest before the learning activities and a posttest after the completion of all learning sessions using the developed worksheet. The administration of these two assessments was intended to provide a comprehensive evaluation of changes in students' learning achievement after they had experienced instruction supported by the developed learning material. This pretest–posttest approach enabled the researchers to examine the effectiveness of the developed LKPD in facilitating meaningful learning and enhancing students' academic performance.

All 22 fifth-grade students participated in both the pretest and posttest as part of the product effectiveness evaluation. The test items administered in both assessments were developed based on the same learning outcome indicators to ensure that any differences in students' scores objectively reflected changes in their conceptual understanding after using the developed Student Worksheet (LKPD). The use of pretests and posttests is a widely accepted approach in educational research to evaluate the effectiveness of an instructional intervention or learning product by comparing students' achievement before and after the implementation of the treatment (Fraenkel et al., 2023). The results of the pretest and posttest are presented in the following section.

Table 4. Pretest and Posttest Results

Component	Pretest	Posttest
Highest score	82	96

Lowest score	55	74
Mean score	68,15	84,32
Learning mastery	35,71%	82,14%

Source: Research Data, 2026.

As presented in Table 4, students' learning achievement improved following the implementation of the Problem-Based Learning (PBL)-based LKPD incorporating local wisdom. The mean score increased from 68.15 on the pretest to 84.32 on the posttest, representing an improvement of 16.17 points. In addition, the percentage of students achieving the predetermined mastery criterion increased substantially from 35.71% to 82.14%. These findings indicate that the majority of students successfully attained the expected level of learning mastery after participating in instruction using the developed LKPD.

Before testing the research hypothesis using a paired-samples t-test, the normality of the learning outcome data was examined using the Shapiro–Wilk test. This preliminary analysis was conducted to verify whether the pretest and posttest scores satisfied the assumption of normal distribution, which is a prerequisite for applying parametric statistical procedures (Mishra et al., 2019). The normality test yielded significance values of 0.164 for the pretest data and 0.087 for the posttest data. Since both values exceeded the significance threshold of 0.05, the data were considered to be normally distributed. Consequently, the assumption of normality was fulfilled, indicating that the dataset was appropriate for further analysis using the paired-samples t-test. The paired-samples t-test was subsequently performed to determine whether a statistically significant difference existed between students' learning outcomes before and after the implementation of the Problem-Based Learning (PBL)-based Student Worksheet (LKPD) integrating Tegal local wisdom. The results of the paired-samples t-test are presented in the following section.

Table 5. Paired Samples t-Test Results

Variable	Sig. (2-tailed)	Decision
Pretest–Posttest	0,000	H ₀ Rejected

Source: Research Data, 2026.

The results of the statistical analysis revealed that the significance value (Sig. (2-tailed)) was 0.000, which was lower than the significance level of 0.05. Therefore, the null hypothesis (H₀) was rejected, whereas the alternative hypothesis (H₁) was accepted. These findings indicate that there was a statistically significant difference in students' learning outcomes before and after the implementation of the Problem-Based Learning (PBL)-based Student Worksheet (LKPD) incorporating local wisdom. This result demonstrates that the developed LKPD had a significant positive effect on improving students' learning achievement.

Discussion

The findings demonstrate that the developed LKPD successfully incorporated the principles of contextual learning by connecting Natural and Social Sciences (IPAS) concepts with situations that students commonly encounter in their daily environment. The inclusion of Tegal local wisdom enhanced the relevance of the learning activities, allowing students to construct knowledge through experiences that reflected their own cultural and environmental context. Such contextual integration is considered an important factor in promoting meaningful learning because it enables students to associate new concepts with prior knowledge and real-world experiences. This result supports previous research indicating that instructional materials enriched with local wisdom improve students' conceptual understanding, learning engagement, and the overall quality of classroom instruction. In addition, the present findings are in agreement with those reported by (Yonanda et al., 2023), who concluded that local wisdom-based learning materials demonstrate high instructional quality by effectively addressing students' learning needs while facilitating the

achievement of the expected learning outcomes.

Overall, the validation results demonstrated that the developed LKPD satisfied the essential principles of effective instructional media by providing an attractive visual appearance, high readability, and adequate support for students' learning activities. Its systematic layout enabled students to follow each stage of the learning process in accordance with the syntax of the Problem-Based Learning (PBL) model. Previous studies have reported that the visual quality and user-friendly navigation of instructional materials contribute to increased learning motivation and greater student engagement during classroom instruction. Furthermore, these findings are consistent with those reported by Sudharsono et al., 2024 who emphasized that instructional media designed according to students' characteristics improve learning effectiveness by presenting information in a more communicative, engaging, and easily understandable manner.

The practicality score of 89.6% indicates that the developed student worksheet (LKPD) is easy to implement in the teaching and learning process by both teachers and students. Teachers reported that each learning stage was systematically organized according to the Problem-Based Learning (PBL) syntax, thereby facilitating classroom implementation. Meanwhile, students responded positively, as the learning activities presented in the worksheet were engaging, easy to understand, and encouraged them to actively participate in solving the given problems. These findings are consistent with those reported by (Altariza et al., 2024). who found that PBL-based student worksheets met the criteria of validity, practicality, and effectiveness while enhancing student engagement through learning activities centered on problem solving and collaborative learning.

The observed improvement indicates that the developed Student Worksheet (Lembar Kerja Peserta Didik/LKPD) effectively facilitated students' understanding of Natural and Social Sciences (IPAS) concepts through contextual learning activities. The presentation of authentic problems related to students' surrounding environment encouraged them to observe, discuss, collect relevant information, and formulate solutions based on the results of their investigations. This learning process is consistent with the principles of Problem-Based Learning (PBL), which emphasizes active student participation, collaborative problem-solving, and knowledge construction through authentic learning experiences rather than passive knowledge acquisition (Wang, 2021). In addition to improving conceptual understanding, the integration of local wisdom into the LKPD provided students with more meaningful learning experiences by connecting instructional content to cultural practices and environmental phenomena encountered in their daily lives. Contextual learning enables students to relate newly acquired knowledge to their prior experiences, thereby promoting deeper conceptual understanding, stronger knowledge retention, and higher engagement in the learning process (Verawati & Wahyudi, 2024).

Statistically, these findings demonstrate that the implementation of the developed LKPD had a positive effect on improving students' learning outcomes. From a pedagogical perspective, this improvement can be attributed to the learning activities that required students to identify problems, gather information from various sources, collaborate in group discussions, express their ideas, and develop solutions based on the results of their investigations. These learning experiences encouraged students to actively construct their own knowledge, leading to a deeper understanding of the concepts being studied. These findings are consistent with those reported by (Latifah et al., 2024), who concluded that local wisdom-based electronic student worksheets significantly improve students learning outcomes by presenting learning materials that are closely connected to their daily lives and sociocultural environment.

The findings of the present study are further supported by Nasir et al., 2024, who reported that integrating local wisdom into student worksheets not only enhances students' conceptual understanding but also fosters critical thinking, problem-solving skills, and active engagement throughout the learning process. By connecting learning materials with students' sociocultural contexts, local wisdom-based instructional resources provide more meaningful and authentic

learning experiences. Therefore, the developed LKPD is not only effective in improving students' learning outcomes in Natural and Social Sciences (IPAS) but also contributes to the creation of contextual, active, and meaningful learning experiences.

Conclusion

This study successfully developed a Problem-Based Learning (PBL)-based Student Worksheet (LKPD) integrating local wisdom for Natural and Social Sciences (IPAS) instruction in elementary schools using the ADDIE development model, which consists of the analysis, design, development, implementation, and evaluation phases. The developed product underwent validation by both subject-matter and media experts and was found to meet the required standards for classroom implementation.

The findings revealed that the developed LKPD achieved an average validity score of 85.70%, which falls within the very valid category. This result indicates that the content, organization, language, and visual design were well aligned with the characteristics of elementary school students while effectively supporting problem-based learning activities. In terms of practicality, the LKPD received positive responses from both teachers and students, demonstrating that it was easy to use throughout the learning process. The systematic organization of learning activities, the use of contextual problems, and the integration of local wisdom enhanced students' engagement and participation at every stage of learning.

The effectiveness of the developed LKPD was reflected in the improvement of students' learning outcomes following its implementation. The mean score increased from 68.15 on the pretest to 84.32 on the posttest, while the learning mastery rate rose from 35.71% to 82.14%. Furthermore, the paired-samples t-test yielded a significance value of 0.000 ($p < 0.05$), indicating a statistically significant difference between students' learning outcomes before and after using the developed LKPD. These findings demonstrate that the implementation of the PBL-based LKPD integrating local wisdom significantly enhanced students' conceptual understanding.

Overall, the findings indicate that the developed PBL-based LKPD integrating local wisdom satisfies the criteria of validity, practicality, and effectiveness, making it a feasible alternative instructional resource for Natural and Social Sciences (IPAS) learning in elementary schools. Beyond improving students' learning outcomes, the product also supports contextual learning by connecting scientific concepts with students' social and cultural environments, thereby fostering more meaningful and active learning experiences. Consequently, integrating innovative instructional models with local wisdom into teaching materials represents a promising strategy for enhancing the quality of IPAS instruction in elementary education.

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