



Development of Electronic Student Worksheets Based On Wizer.Me In Mathematics Lessons

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Citation: Chahyani, A. F., Hendracipta, N., & Rahmani, A. (2026). Development of Electronic Student Worksheets Based On Wizer.Me In Mathematics Lessons. Kognitif: Jurnal Riset HOTS Pendidikan Matematika, 6(4), 1682–1697. <https://doi.org/10.51574/kognitif.v6i4.5282>

ARTICLE INFO

ARTICLE HISTORY:

Received Jun 07, 2026

Accepted Aug 31, 2026

Published Online Oct 15, 2026

KEYWORDS:

Elementary School

E-Worksheet

Mathematics

Wizer.me

ABSTRACT

Rapid advances in educational technology encourage educators to provide innovative and interactive learning media that actively engage students in the learning process. However, the use of technology in mathematics education remains suboptimal, particularly in the use of digital worksheets. This study aimed to develop a Wizer.me-based Electronic Student Worksheet (E-LKPD) focusing on comparing the properties of quadrilaterals, determine the feasibility of the developed product, and analyze students' responses to its use. This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The trial participants consisted of 34 students, with a preliminary trial involving Grade VI students and a field trial involving Grade V students. Product validation was conducted by two subject-matter experts, two media experts, and one language expert with relevant expertise. Data were collected through observation, interviews, document analysis, questionnaires, and documentation. Document analysis was conducted to examine the curriculum, learning outcomes, learning objectives, teaching modules, and learning materials as the basis for developing the E-LKPD. The data were analyzed descriptively and quantitatively using percentage calculations. The results showed that the E-LKPD received scores of 92.0% from the subject-matter experts, 95.2% from the media experts, and 95.0% from the language expert, with an overall average of 94.07%, categorized as highly feasible. The responses of the 34 students reached 93.7%, categorized as strongly agree. Therefore, the Wizer.me-based E-LKPD was considered highly feasible for use as an interactive digital learning medium for teaching students to compare the properties of quadrilaterals and received highly positive responses from the participating students.



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Introduction

The transformation of information and communication technology (ICT) has fundamentally changed the educational landscape, shifting the learning paradigm from one-way transmission toward interactive and student-centered learning (Hsieh et al., 2025; Zambak & Tyminski, 2020). Twenty-first-century education requires students to develop essential competencies, including critical thinking, creativity, collaboration, and communication. These competencies can be optimally stimulated through the integration of technology into the teaching and learning process (Copur-Gencturk & Doleck, 2021; Haataja et al., 2024; Krawitz et al., 2026). The effectiveness of contemporary learning is closely related to the ability of both educators and students to use ICT, as technology facilitates educational communication and supports the achievement of planned learning objectives (Arvanitaki & Zaranis, 2020).

Digital-based learning enables learning materials to be presented through visual, audio, and interactive simulation formats, which have been shown to be more effective in supporting academic achievement than conventional approaches (Clark-Wilson et al., 2020; Günster & Weigand, 2020; Ratnayake et al., 2020). Students who use digital devices tend to experience a more communicative learning environment and demonstrate active participation in classroom activities, which may contribute to improved academic performance (Freeman et al., 2020). This condition indicates that technology is no longer merely an additional facility but has become an essential component of contemporary education, particularly for students who are already familiar with digital devices and applications in their daily lives.

Despite various government policies encouraging the digitalization of primary education, implementation readiness in schools remains suboptimal. Preliminary observations revealed that although government-provided Chromebooks were available at the school, their use in teaching and learning activities was still limited. The principal confirmed that this condition was primarily caused by two factors: (1) limited training for educators in using the devices (Ratnayake et al., 2020) and (2) insufficient integration of technology into lesson planning (Swidan & Fried, 2021). Interviews with the Grade V teacher further supported these findings. Although several digital learning platforms were available, their implementation was constrained by technical issues. For example, some digital worksheets did not automatically save students' responses. Consequently, teachers continued to rely heavily on lecture-based instruction and conventional printed textbooks rather than utilizing interactive digital tools that could provide a more engaging learning experience. This gap directly affects two aspects. First, conventional printed worksheets do not provide interactive features such as videos, quizzes, or automated feedback, which are important for supporting students' independent learning in the digital era (Swidan et al., 2022). Second, the assessment process requires teachers to check students' work manually, which is time-consuming and limits real-time monitoring of students' learning progress (Günster & Weigand, 2020). These conditions may hinder the achievement of optimal mathematics learning objectives, particularly in geometry, which requires strong visual understanding, such as comparing the properties of quadrilateral shapes.

The Electronic Student Worksheet (E-LKPD) represents a relevant solution to address these challenges. In addition to being environmentally friendly because it reduces the use of paper, an E-LKPD allows visualizations, interactive simulations, and automated assessment systems to be integrated into a single platform (Yasin et al., 2019). The integration of multimedia and interactive elements can facilitate contextual and active learning that is aligned with the needs of today's digital generation (Kaiser et al., 2025; Stohlmann, 2019). One platform that supports these characteristics is Wizer.me, a web-based application that enables educators to design interactive digital worksheets equipped with visualizations of geometric

shapes, automated quizzes, and immediate feedback without requiring programming skills (Sugiarti et al., 2026). For learning materials involving comparisons of quadrilateral properties, which require strong visual understanding, this platform provides flexibility for educators to design learning activities that reduce monotony while supporting students' conceptual understanding. This is particularly relevant for elementary school students, who may become less engaged when learning is dominated by one-way instruction.

Several previous studies have explored the development of digital mathematics worksheets across different educational levels and instructional contexts. A Wizer.me-based E-LKPD on probability was developed for Grade XII senior secondary students, with an emphasis on assessing product validity (Suci et al., 2024). A mathematics E-LKPD on circles was designed for Grade VIII students by combining an open-ended approach with Flip PDF Professional to support conceptual understanding (Kaliappen et al., 2021). Differentiated instruction was also incorporated into a Wizer.me-based E-LKPD on plane figures to accommodate diverse learning needs, although the educational level was not specified (Firda Maulina et al., 2025). In contrast, the present study focuses on Grade V elementary students and specifically addresses the comparison of quadrilateral properties, including those of squares, rectangles, parallelograms, and rhombuses. The developed E-LKPD integrates videos, images, and digital links as supporting learning resources. These studies share an emphasis on developing digital resources to support mathematics learning. However, two gaps can be identified within the reviewed literature. First, the explicitly identified educational contexts concern secondary school students, leaving the design of such resources for elementary learners insufficiently addressed in these studies. Second, the treatment of plane figures remains broad rather than specifically examining the comparison of quadrilateral properties (Aisyah & Supriyo, 2024; Setyawardani & Edy, 2024). The novelty of the present study therefore lies in its development of a Wizer.me-based E-LKPD tailored to Grade V learners and its focused treatment of quadrilateral comparisons. Supporting multimedia resources are incorporated to make the content more accessible and responsive to the intended learners' needs.

Method

Research Design

This study adopted a Research and Development (R&D) approach to develop and evaluate a Wizer.me-based Electronic Student Worksheet (E-LKPD) tailored to classroom needs. Development followed the ADDIE model through five stages: analysis, design, development, implementation, and evaluation. This framework guided the alignment of the product with users' needs and the intended learning objectives. The resulting E-LKPD was designed for Grade V mathematics, specifically to support the comparison of properties of squares, rectangles, parallelograms, and rhombuses. Classroom trials were conducted to examine its feasibility and students' responses. The study collected qualitative and quantitative data. Qualitative data captured teachers' and students' learning resource needs, teachers' feedback on the product, and findings from interviews and classroom observations. Quantitative data comprised scores from expert validation forms and student response questionnaires, providing evidence of product feasibility and user acceptance.

Participants

The research was conducted at SDN Pandeglang 7, located on Jalan Gunung Karang, Cihaseum, Pandeglang Regency, Banten Province. The school was selected based on three considerations. First, the school had an A-level accreditation with a score of 96, making it a representative setting for educational innovation. Second, the school was a designated Sekolah Penggerak that had implemented the Merdeka Curriculum and received an award from the Regent of Pandeglang in 2024. Third, the school had supporting infrastructure, including Chromebooks, internet connectivity, and multimedia facilities, although these resources had not been optimally utilized in mathematics instruction. The research participants consisted of primary and secondary data sources. Primary data sources included Grade V students as the direct users of the E-LKPD, one Grade V teacher as an informant regarding learning needs, the principal as an informant concerning institutional conditions, and four groups of experts—an instrument expert, subject-matter experts, media experts, and a language expert—who validated the research instruments and product before implementation. Secondary data were obtained from curriculum documents, school profiles, and relevant previous research literature concerning the development of digital learning media.

Instruments

Data were collected through observation, interviews, documentation, and questionnaires. An observation sheet was used to examine the initial conditions of Grade V mathematics instruction before the E-LKPD was introduced. It covered ten aspects, including the clarity of teachers' explanations, students' participation in discussions, and the use of digital learning resources. The findings informed the needs analysis during the analysis stage of the ADDIE model. Semi-structured interviews with the principal and Grade V teacher explored their experiences with electronic worksheets, the strengths and limitations of existing learning resources, and the features expected in the proposed E-LKPD. This format allowed follow-up questions while maintaining alignment with the research objectives. Documentation complemented these findings through school profiles, accreditation records, teaching modules, and photographs of classroom activities and product trials.

Four expert validation questionnaires were prepared to assess distinct aspects of the instruments and product. Instrument validation examined the format, instructions, content suitability, and language of the research instruments. Subject-matter validation addressed alignment with the intended competencies, the clarity of practice questions, and the integration of interactive and audiovisual elements. Media validation focused on the visual design of the cover and content, together with product usability. Language validation examined accuracy, clarity, developmental appropriateness, and adherence to Indonesian language conventions. All expert questionnaires employed a five-point rating scale ranging from “not feasible” to “highly feasible.” Students' perceptions were assessed using a questionnaire containing 13 statements across three dimensions: appearance, content presentation, and usefulness. Appearance covered color, readability, layout, and design, while content presentation addressed instructional clarity, the sequence of materials, the appropriateness of practice questions, and language. Usefulness captured students' perceptions of independent use, support for conceptual understanding, learning motivation, and digital skills. Responses were recorded on a five-point Likert scale ranging from “strongly disagree” to “strongly agree”.

Procedures

The development procedure followed the five stages of the ADDIE model. The Analysis stage involved identifying students' needs, evaluating the existing learning conditions at the school, and examining the alignment of the learning materials with the curriculum. This stage resulted in the identification of the need for an interactive E-LKPD. The Design stage involved preparing the initial E-LKPD design, determining its content, learning sequence, and interactive features, and designing an attractive interface appropriate for elementary school students. The output of this stage was an initial Wizer.me-based product design. The Development stage involved creating the initial product on the Wizer.me platform, preparing learning materials, practice questions, and supporting videos. The product was subsequently validated by four groups of experts: instrument, subject-matter, media, and language experts. Revisions were then made based on the experts' recommendations to produce the final E-LKPD ready for trial. The Implementation stage involved product trials with students, observations of student interaction and responses during learning, and the administration of response questionnaires. This stage generated data concerning the practicality and acceptance of the learning medium. The Evaluation stage involved analyzing the trial results and user feedback, followed by final revisions to the product's content, appearance, and technical aspects. The final product was considered suitable for use in mathematics learning. The procedure flow is presented in Figure 1.

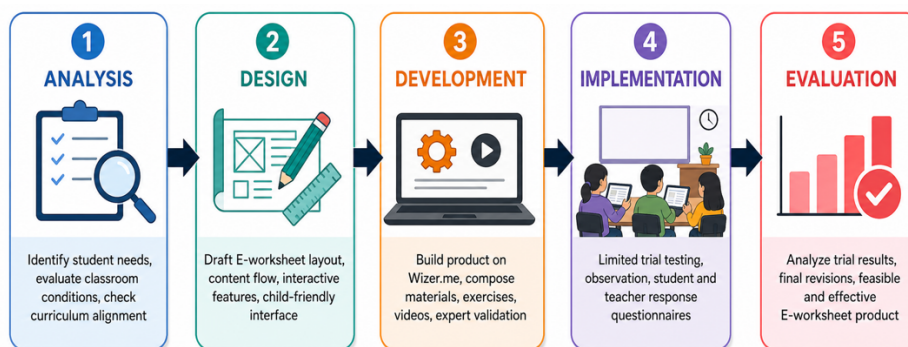


Figure 1. ADDIE Development Model

Data Analysis

The collected data were analyzed using complementary quantitative and qualitative approaches. Quantitative analysis was conducted by calculating percentages and mean scores from expert validation questionnaires and student response questionnaires. The percentage of expert validation was calculated using the following formula:

$$NP = \frac{R}{SM} \times 100\%$$

where NP represents the feasibility percentage, R represents the obtained raw score, and SM represents the maximum score (Purwanto, 2014). The percentages were interpreted using five categories: very low feasibility (0–20%), low feasibility (21–40%), moderate feasibility (41–60%), feasible (61–80%), and highly feasible (81–100%) (Sugiyono, 2018). For student responses, the percentage was calculated using:

$$NP = \frac{n}{N} \times 100\%$$

where n represents the total obtained score and N represents the maximum possible score (Agustin, 2024). The results were interpreted into five categories: strongly disagree (0–20%), disagree (21–40%), undecided (41–60%), agree (61–80%), and strongly agree (81–100%) (Sugiyono, 2023). Qualitative analysis was conducted by examining written suggestions and comments from experts and students in the open-ended sections of the questionnaires. These data were described to identify the strengths and weaknesses of the product and were subsequently used as a basis for revising and improving the E-LKPD.

Research Findings

Needs Analysis

The analysis stage began with interviews with the principal and two teachers, as well as direct observation of mathematics learning in Grade V. Three main findings were identified. First, the school had relatively adequate technological infrastructure, consisting of 15 Chromebooks, six teacher laptops, one smart board, and a stable Wi-Fi network. However, the use of digital worksheets in mathematics learning remained limited. Second, mathematics learning on plane figures still relied heavily on printed Merdeka Curriculum textbooks. Previously implemented E-LKPDs also encountered difficulties related to the automatic storage and management of students' scores. Third, classroom observations indicated relatively low levels of active student participation and difficulties in understanding abstract concepts, such as comparing the properties of quadrilateral shapes, due to the limited availability of supporting visual media. An analysis of the learning materials in relation to the Merdeka Curriculum showed that, in Phase C, students are expected to understand various plane figures and identify their characteristics. Based on these learning outcomes, the E-LKPD focused on four quadrilaterals—squares, rectangles, parallelograms, and rhombuses—with learning activities arranged progressively, beginning with the introduction of shapes, followed by identification of their properties, and finally comparison of similarities and differences among the shapes. These findings served as the basis for developing an interactive Wizer.me-based E-LKPD.

Product Design

The product was designed by developing an initial storyboard using Canva Pro before transferring it to Wizer.me to incorporate interactive features such as instructional videos and various question formats, including open questions, multiple choice, matching, tables, and sorting. The final E-LKPD consisted of 28 pages in a combination of A4 portrait and landscape formats and could be accessed through a Wizer.me link and QR code. The E-LKPD contained eleven main components: a mathematics-themed cover and header; curriculum components consisting of learning objectives and learning outcomes; illustrated learning materials accompanied by instructional videos; task completion guidelines; ten competency test items using various interactive formats; a chat box for discussion; an emoji-based student reflection section; a glossary; references; an appreciation page; and a developer profile. The research instruments developed at this stage consisted of four expert validation questionnaires—for instruments, subject matter, media, and language—and one student response questionnaire.

containing 13 statements. All instruments were validated before being used for product assessment.

Product Feasibility

The feasibility of the E-LKPD was assessed through a validation process involving one instrument expert, two subject-matter experts, two media experts, and one language expert. The results of the validation assessment are summarized in [Table 1](#).

Table 1. Recapitulation of Expert Validation Results for the Wizer.me-Based E-LKPD

Validator	Obtained Score	Maximum Score	Percentage	Interpretation
Instrument Expert	51	55	92,72%	Highly Feasible
Subject-Matter Experts (2 validators)	184	200	92,00%	Highly Feasible
Media Experts (2 validators)	238	250	95,20%	Highly Feasible
Language Expert	57	60	95,00%	Highly Feasible
Average (subject matter, media, and language)	—	—	94,07%	Highly Feasible

The subject-matter experts gave the highest scores to curriculum and learning-objective alignment and content and conceptual feasibility, both at 95%. The lowest score, 86%, was obtained for student engagement and higher-order thinking development, indicating that the depth of questions requiring students' reasoning could still be improved. The media experts consistently provided high ratings across all aspects, ranging from 95% to 95.5%, particularly for the overall appearance and visual design. The language expert gave a perfect score of 100% for language accuracy, while the aspect concerning developmental appropriateness received a relatively lower score of 90%.

Based on these results, the Wizer.me-based E-LKPD focusing on comparing the properties of quadrilaterals was categorized as highly feasible for Grade V mathematics learning. Revisions were made based on the recommendations of the subject-matter experts. These revisions included adding a link to the usage instructions, reorganizing the sequence of materials from general to specific concepts, increasing font size, adding examples of geometric shapes, and improving the questions so that they required students not only to identify the names of shapes but also to explicitly state their properties. All recommendations were addressed before the final product was tested with students.

Implementation

Before implementation with Grade V students, an initial trial was conducted with Grade VI students on May 9, 2026, because they had previously studied plane figures. The purpose was to assess the suitability and difficulty level of the questions. The trial was conducted through a Wizer.me link distributed using a barcode. Students accessed the E-LKPD using their

personal mobile phones because the school Chromebooks were being prepared for examinations. The Grade VI students demonstrated enthusiasm and interest while completing the interactive questions. Based on this initial trial, additional instructions concerning email accounts and passwords were added for students who accessed the E-LKPD using their parents' phones.

The main implementation was conducted face-to-face on May 16, 2026, involving 34 Grade V students. Students accessed the E-LKPD through a Wizer.me link distributed via a barcode and a link displayed on the classroom board, using either school Chromebooks or personal mobile phones. The learning process combined lectures, discussions, question-and-answer activities, and individual assignments. The main activities included an introduction to the E-LKPD through a projector, explanation of the usage instructions, exploration of the learning materials through visual elements such as text and images and auditory elements such as instructional videos, and independent completion of practice questions according to students' individual learning preferences. Throughout the implementation, the teacher and researcher provided guidance to students experiencing technical difficulties. The session concluded with the administration of the student response questionnaire.

During the implementation stage, the E-LKPD was used directly in the classroom with the support of school Chromebooks and an internet connection. Before the lesson began, the teacher explained the learning objectives, the material to be studied, and the steps for using the E-LKPD. Students were then instructed to access the E-LKPD through the provided link or QR code. After successfully accessing Wizer.me, students completed the learning activities step by step. They first studied the materials, observed the instructional images and videos, and then completed interactive exercises and quizzes on comparing the properties of quadrilaterals. Students completed each activity independently according to the instructions provided in the E-LKPD. After completing the activities, students' answers could be checked through the Wizer.me system, allowing them to receive immediate feedback. The teacher acted as a facilitator by assisting students who experienced difficulties and monitoring their work through the activities conducted on the Wizer.me platform.

Throughout the implementation, students appeared enthusiastic about using the Wizer.me-based E-LKPD. They showed particular interest when accessing instructional videos, observing images, completing interactive quizzes, and receiving automated feedback from the system. The use of Wizer.me also provided students with opportunities to complete tasks more independently and follow the learning activities according to the instructions provided. Nevertheless, several challenges were encountered. The use of the E-LKPD depended on the availability of compatible devices and a stable internet connection. Some students also required assistance when accessing or operating the E-LKPD. Therefore, the teacher provided continuous support during the learning process to ensure that all students could participate effectively. The student response questionnaire resulted in an overall percentage of 93.7%, categorized as strongly agree. Observations during the trial also indicated that students appeared enthusiastic, active, and interested in participating in the learning activities. They showed considerable interest in watching instructional videos, completing interactive quizzes, and receiving automated feedback. Several students also appeared more independent when completing assignments compared with their experiences using printed worksheets (See, [Figure 2](#)).

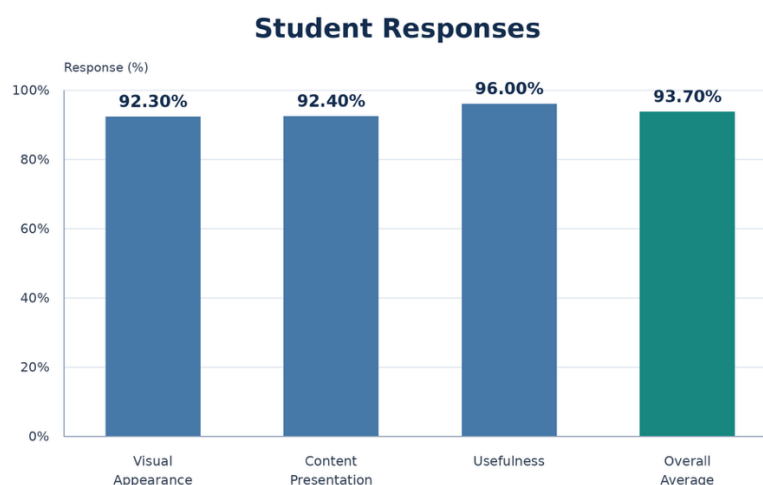


Figure 2. Percentage of Student Response Results

The post-implementation interview with the Grade V teacher confirmed that the Wizer.me-based E-LKPD provided a more interactive learning experience. Students appeared more active and enthusiastic, while the materials were considered appropriate for the learning objectives and relatively easy for both teachers and students to use. However, the trial also revealed three technical limitations: students were required to log in using their individual accounts, each account could access the activity only once, and submitted answers could not be edited. Some students also required assistance in operating digital devices, while unstable internet connectivity occasionally disrupted the learning process.

Evaluation Results and Student Responses

The evaluation stage measured the level of product acceptance through a student response questionnaire consisting of 13 statements covering three aspects: appearance, material presentation, and usefulness. The questionnaire was administered to 34 Grade V students with direct assistance from the researcher. The recapitulation results are presented in Table 2.

Table 2. The results of students' responses to the Wizer.me-based E-LKPD (n = 34).

Aspect	Obtained Score	Maximum Score	Percentage	Category
Appearance	628	680	92,3%	Strongly Agree
Material Presentation	377	408	92,4%	Strongly Agree
Usefulness	653	680	96,0%	Strongly Agree
Total	1.658	1.768	93,7%	Strongly Agree

Student response percentages were calculated by comparing the total obtained score with the maximum possible score. The total score obtained was 1,658 out of a maximum of 1,768 (34 students $\times$ 52 points), resulting in an overall percentage of 93.7%. The usefulness aspect recorded the highest percentage (96.0%), indicating that students found the E-LKPD practically helpful in supporting their understanding of mathematics. Meanwhile, the appearance and

material presentation aspects showed relatively similar percentages, namely 92.3% and 92.4%, respectively. All scores fell within the 81–100% range and were therefore categorized as “Strongly Agree.”

Overall, the findings from the evaluation stage further support the results of the expert feasibility assessment. The Wizer.me-based E-LKPD on comparing the properties of quadrilateral shapes was rated as highly feasible in terms of content, media, and language, with an overall feasibility score of 94.07%. In addition, the product received a highly positive response from its direct users, namely Grade V students, with an overall response rate of 93.7%. Several technical constraints associated with the Wizer.me platform were also identified during implementation, including the use of a single account for access, one-time access to the worksheet, and the inability to edit submitted answers. These limitations should be considered in future development to improve the flexibility and usability of the E-LKPD.

Discussion

Addressing the Gap Between Technological Availability and Classroom Use

The development of the Wizer.me-based electronic student worksheet (E-LKPD) responded to a gap between the availability of technological resources and their meaningful use in mathematics instruction. The preliminary investigation indicated that the school had supporting devices and internet access, yet classroom learning continued to rely predominantly on conventional materials. This finding suggests that technological availability alone was insufficient to generate changes in instructional practice. What was needed was a learning resource that connected the available infrastructure with specific mathematical objectives and classroom activities. The significance of the developed E-LKPD therefore extends beyond replacing printed worksheets with a digital format. Its instructional value lies in how mathematical content, visual representations, and response activities were organized to support the comparison of quadrilateral properties (Habsyi et al., 2022; Setyawardani & Edy, 2024). From this perspective, digitalization becomes pedagogically meaningful when it changes the opportunities students have to examine, compare, and explain mathematical ideas, rather than merely changing the medium through which information is presented. This distinction is particularly relevant to quadrilateral learning. Recognizing a familiar shape does not necessarily indicate that a student understands its defining properties or its relationships with other shapes (Aditia & Széll, 2025). Consequently, the E-LKPD should be understood as a resource for organizing opportunities to investigate these relationships. Whether those opportunities lead to deeper understanding remains a question that requires evidence from students’ mathematical work, rather than from product evaluations alone.

Aligning the Development Process with Instructional Needs

The ADDIE framework provided a structure for connecting the identified classroom needs with product design, expert evaluation, implementation, and refinement. Its contribution was not simply that development proceeded through a sequence of stages, but that those stages created opportunities to examine the alignment between learning objectives, task design, presentation, and usability. The initial analysis informed the development priorities, while expert review and classroom implementation provided different perspectives on the suitability of the resulting resource. Within this process, the integration of materials developed in Canva into Wizer.me supported the construction of a visually organized and interactive worksheet.

However, the combination of digital tools should not itself be treated as an instructional innovation. A more substantive contribution depends on whether the resulting activities require students to attend to relevant mathematical properties and express their understanding (Freeman et al., 2020; Rocha, 2020). Visual appeal and technical functionality are enabling conditions; they are not substitutes for purposeful mathematical tasks. The development process is therefore most appropriately interpreted as a means of establishing initial product quality. It provides a basis for classroom use and further evaluation, but does not independently demonstrate learning effectiveness. Keeping this distinction explicit allows the study to make a clear contribution without extending its conclusions beyond the evidence collected.

Interpreting Expert Judgments of Product Feasibility

The favorable expert evaluations indicate that the E-LKPD was considered appropriate in terms of mathematical content, media design, and language. These dimensions address complementary aspects of product quality. Content evaluation concerns the alignment of materials and activities with the intended learning objectives. Media evaluation addresses the organization and operation of the digital resource, while language evaluation considers whether students can understand its instructions and explanations. The relationship among these dimensions is more important than their individual ratings. Mathematically accurate content may be difficult to access if instructions are unclear, while an attractive interface may offer limited educational value if the tasks do not address the intended concepts. The expert findings therefore support the interpretation that the product achieved an acceptable balance between disciplinary content and learner accessibility. Nevertheless, expert judgments should be interpreted within their proper evidential scope. They establish that the product met the criteria used by the assessors, not that students necessarily developed stronger mathematical understanding through its use. Similarly, the separate evaluation of the research instrument concerns the appropriateness of the data collection tool and should not be conflated with validation of the learning product. Comparisons with earlier development studies are useful primarily for identifying a shared pattern of favorable evaluations. They are less useful for establishing that one product is better than another, because assessment criteria, evaluator expectations, and implementation contexts may differ. Accordingly, the present findings are better positioned as contextual evidence supporting the suitability of the developed E-LKPD than as proof of superiority over previously reported products (Suci et al., 2024; Sugiarti et al., 2026).

Understanding Students' Acceptance of the E-LKPD

Students' favorable responses suggest that the E-LKPD was well received during implementation. Their evaluations of appearance, content presentation, and usefulness indicate that the product was perceived as accessible and relevant to the learning experience. These findings complement the expert evaluations by showing that a resource judged appropriate by specialists was also positively received by its intended users. Perceived usefulness is particularly meaningful because it directs attention beyond visual attractiveness. A digital worksheet may initially attract students through its appearance, but its practical value depends on whether they can navigate the materials, understand the tasks, and use the available features to participate in learning. The response pattern is consistent with the interpretation that students

regarded the E-LKPD as a functional learning resource, although the questionnaire alone cannot identify which features contributed most strongly to that perception.

At the same time, acceptance should not be equated with conceptual understanding. Students may enjoy a learning activity or consider it easy to use while continuing to experience difficulties in explaining mathematical relationships (Aisyah & Supriyo, 2024; Setyawardani & Edy, 2024). Positive responses therefore support claims about the perceived learning experience, but not direct claims about improved achievement, reasoning, or retention (Firda Maulina et al., 2025; Kaliappen et al., 2021). The duration and conditions of implementation also matter. Favorable responses during an initial trial may reflect both the instructional qualities of the resource and students' interest in an unfamiliar learning format. The available evidence does not distinguish these explanations. Repeated implementation would help determine whether acceptance persists as students become more familiar with the platform.

Turning Digital Interactive into Mathematical Reasoning

The E-LKPD incorporated several activity formats, including matching, multiple-choice questions, open-ended responses, drawing, and multimedia materials. These features created different ways for students to interact with the content. However, interaction with an interface should be distinguished from engagement in mathematical reasoning. The educational significance of each feature depends on what students must notice, decide, or explain to complete the task. For example, a matching activity may ask students to associate a shape with a familiar label, or it may require them to connect a figure with a set of defining properties. Although both activities involve the same technical feature, they place different demands on students' thinking. Likewise, a drawing task becomes more informative when students must explain how their construction satisfies particular conditions rather than simply reproduce a displayed figure. For quadrilateral learning, the instructional priority should therefore be the reasoning embedded in the tasks. Activities could invite students to compare figures, justify classifications, or examine whether a property applies to more than one category (Clark-Wilson et al., 2020; Kärki et al., 2022). These are implications for strengthening the design, rather than outcomes established by the present study. Their value would need to be examined through students' explanations and task performance. Automated assessment also requires a qualified interpretation. Immediate information about answer correctness can support classroom task management, but correctness alone does not reveal the quality of the reasoning behind a response. Teacher follow-up remains necessary when students need to explain an answer, reconsider a classification, or identify the source of an error (Günster & Weigand, 2020). In this sense, the platform is best positioned as a resource that supports teacher-guided mathematical activity rather than replaces it.

Implementation Constraints and Implications

The classroom trial identified practical constraints related to internet stability, device operation, and access or submission procedures. These findings show that the implementation of a digital worksheet depends on more than the quality of the product itself. A resource may be well designed but still be difficult to use consistently when students encounter technical barriers or require assistance navigating the platform. The need for technical support also has implications for interpreting student participation. Difficulty completing an activity may reflect unfamiliarity with the interface rather than difficulty understanding the mathematical content. Classroom preparation should therefore help separate these two sources of difficulty. Clear

operational instructions, introductory practice, and accessible technical assistance would allow teachers to focus more directly on students' mathematical needs.

The submission restrictions encountered during the trial deserve particular attention because they may affect opportunities for revision. If students cannot modify an answer after receiving feedback under the configuration being used, the worksheet may function more readily as a response-collection tool than as a space for iterative learning. Teachers would then need to provide alternative opportunities for students to discuss and revise their reasoning. These restrictions should be reported as conditions observed during the implementation, rather than generalized to every platform configuration. Such considerations also limit transferability. Schools differ in connectivity, device availability, teacher preparation, and students' digital familiarity (Freeman et al., 2020; Swidan et al., 2020). Consequently, the favorable findings from the participating classroom should not be assumed to apply unchanged elsewhere. Broader implementation would require adaptation to local conditions and attention to whether all students can participate in the intended activities.

Conclusion

This study developed a Wizer.me-based Electronic Student Worksheet (E-LKPD) for learning to compare quadrilateral properties in Grade V at SDN Pandeglang 7. Guided by the ADDIE model, the development process connected the identification of classroom needs with product design, expert review, implementation, and refinement. The preliminary analysis revealed that the school's technological resources had not been fully integrated into mathematics instruction. In response, the E-LKPD combined learning materials, instructional videos, interactive tasks, and discussion opportunities by integrating Wizer.me with resources developed or accessed through Canva Pro and YouTube. Expert evaluations supported the product's feasibility in terms of content alignment, media design, and language appropriateness. Students also responded favorably to its appearance, content presentation, and perceived usefulness. Together, these findings indicate that the E-LKPD is a feasible and well-received resource for the intended learning context. However, the evidence establishes product appropriateness and student acceptance rather than improvements in mathematical understanding or achievement. Its effectiveness relative to conventional learning resources therefore remains to be investigated.

The study highlights an opportunity to connect existing school infrastructure with more purposefully designed digital mathematics activities. Successful implementation nevertheless requires adequate preparation, including students' and teachers' familiarity with digital tools, reliable internet access, and procedures for managing the access and submission restrictions encountered during the trial. These conditions should inform any adaptation of the product to other classrooms or schools. For teachers, the E-LKPD offers an alternative resource that brings together content presentation, varied response activities, and automated assessment. These features should complement teacher guidance, particularly when students need feedback on their mathematical explanations rather than answer correctness alone. For schools, the findings underscore the importance of supporting teachers in integrating digital resources into instructional planning, rather than treating device availability as sufficient evidence of technological readiness. Future research should involve more diverse learning contexts, examine sustained classroom use, and assess students' conceptual understanding and reasoning. Such investigations would clarify not only whether the E-LKPD is acceptable, but also how and under what conditions it contributes to mathematics learning.

Declarations

- Conflict of Interest** : The authors declare that there are no conflicts of interest.
- Auhor Contributions** : A.F.C: Conceptualization, Methodology, Investigation, Writing – original draft.
 N.H.: Conceptualization, Methodology, Formal analysis, Writing – original draft.
 A.R.: Writing – review & editing. All authors have read and approved the final version of the manuscript.
- Data Availability Statement** : Data supporting the findings of this study are available from the author, A.F.C., upon reasonable request.
- AI Statement** : The authors state that generative AI tools were used solely to improve the clarity, grammar, and readability of the English language in the manuscript. All content, research findings, and data analysis were produced by the authors. The authors take full responsibility for the accuracy, originality, and integrity of the manuscript.

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