Journal of Instructional Mathematics
E-ISSN 2722-2179
DOI: 10.37640/jim.v7i1.2605
Volume 7, Issue 1; 2026

# Development of RME-Based Electronic Student Worksheet on Peatland Context for Pythagoras Theorem in Grade VIII Junior High School

**Setri Oktavia*, Loy Cindy Br Milala, Putri Sasalia S., Sugiharto**
Department of Matematics Education, Universitas Palangka Raya, Indonesia
*setrioktavia@gmail.com

**Article Info**

Received
November 30, 2025

Revised
February 6, 2026

Accepted
March 12, 2026

Keywords

RME;
Student Worksheet;
Peatlands;
Pythagoras.

**Abstract**

The learning approach used in the following research is the Realistic Mathematics Education (RME) approach by utilizing peatlands as a context and digital media as a tool. The learning media developed is the electronic student worksheet with the help of liveworksheets in its use. Currently, schools have not developed electronic student worksheet assisted by liveworksheets and have not used peatlands as a context. The purpose of the following this study is conducted to produce a product as electronic student worksheet proven to be valid and practical for implementation, so that students are motivated in learning. The following research uses 4 of the 5 ADDIE stages. The results of the study show that the developed electronic student worksheet is feasible and practical to use with an average of 91% and 82% from 2 validators respectively with very feasible criteria. According to the results of the calculation of the response questionnaire from 30 students and 1 educator, it states that electronic student worksheet is practically used in learning with an average of 89% and 88% respectively. It is hoped that future researchers can use the following electronic student worksheet to see its practicality from year to year.



How to Cite:
Oktavia, S., Milala, L. C. B., Sasalia S., P., & Sugiharto, S. (2026). Development of RME-Based Electronic Student Worksheet on Peatland Context for Pythagoras Theorem in Grade VIII Junior High School. *Journal of Instructional Mathematics*, *7*(1), 1-15.

## INTRODUCTION

The advancement of the times has made technology influential for all groups in various fields, such as business, education, news, health, social affairs, and entertainment (Maharani et al., 2021). The research conducted by the researcher focuses on the field of education. Technology has a positive impact on educators and students, as educators can obtain information, relevant learning materials, utilize various applications as tools and learning media, and it can also help educators deliver material effectively and interactively, allowing students to be more active and less easily bored in class (Siregar & Padli, 2023). For students, technology can support independent learning through the availability of online materials and can improve students' motivation and understanding (Iskandar et al.,

2023). Therefore, educators must be able to use technology effectively as an auxiliary tool in the learning process to create a more interactive, active, engaging, and non-boring classroom atmosphere, so that students can gain increased learning motivation and better understanding of the material.

Mathematics learning is often considered boring due to a monotonous classroom atmosphere, lack of interactivity, low student engagement, and limited use of digital media in instruction (Yestina & Ratnaningsih, 2023). Specifically, in the topic of the Pythagorean Theorem, students struggle to understand the concept because they feel bored in class and become confused when identifying elements of a triangle, such as the legs and the hypotenuse (Inayah et al., 2024). The Pythagorean Theorem serves as a foundation for students to learn subsequent materials related to it, such as trigonometry (Setiawan et al., 2021). It also helps students solve real-life problems, for example determining the shortest distance between two different directions from the same starting point (Azizah et al., 2024). To address these learning difficulties, educators must utilize various innovations and implement learning strategies that support mathematics instruction to be more systematic, interactive, and active, one of which is integrating technology into instructional media in the form of student worksheets (Apriyantini & Sukendra, 2023).

A Student Worksheet is a type of learning material that includes questions and information designed and structured to help students develop creative ideas to complete the worksheet systematically (Firtsanianta & Khofifah, 2022). An student worksheet can be presented in either hardcopy or softcopy form. Hardcopy student worksheet have not been effective in increasing students activeness and learning motivation; therefore, technology-assisted student worksheet in softcopy form are needed (Noormiati et al., 2023). Softcopy student worksheet are presented using technology, namely electronic student worksheet. Electronic student worksheet is a worksheet that utilizes electronic media, allowing students to access it anytime and anywhere, making the worksheet more practical and serving as a training tool to develop students' critical, creative, and effective thinking skills (Bela & Ferawaty, 2023; Indriani & Sakti, 2022; Tanaka et al., 2023). The purpose of electronic student worksheet is to increase students' engagement in learning so that they can easily access and revisit the worksheet until they fully understand the material (Dahari et al., 2024; Suryandari et al., 2023). Based on this, an electronic student worksheet is a worksheet designed by educators to facilitate the learning process and can be accessed electronically by students.

Technology-assisted student worksheet can be created using various platforms, one of which is Liveworksheet. Liveworksheet is a website that allows the creation of electronic student worksheet in PDF form to be more interactive by incorporating images, audio, videos, and enabling students to fill in the worksheet directly on the screen, as well as allowing both students and teachers to immediately see the scores obtained (Hurrahma & Sylvia, 2022; Murtalib et al., 2022). Electronic student worksheet created using liveworksheet enable students to access them whenever and wherever there is internet access, and is additionally enables teachers in designing electronic student worksheet systematically and attractively, thereby motivating students to learn and preventing boredom within the learning process (Lestari, 2022). Grounded on this, the researcher chose the liveworksheet website as a tool to develop interactive and engaging electronic student worksheet, with the

purpose of creating mathematics learning more enjoyable and increasing students' motivation and engagement.

One of the mathematics learning approaches that can present information, create an interactive classroom environment, enhance students' creativity, and support the development of innovative electronic student worksheet is the Realistic Mathematics Education (RME) approach. RME is a learning method that utilizes students' real-life situations and experiences as the starting point in the learning process (Sari & Amir, 2021). The real-world problems used can be based on students' experiences as prior knowledge that encourages them to solve problems, identify problems, and organize the main ideas (Angraini & Muhammad, 2023; Sari & Amir, 2021). RME was first developed by Edu Wijdeveld, Fred Goffre, and Adri Treffers in 1968. The approach was later introduced and further developed by the Freudenthal Institute in the Netherlands in 1970 (Hered et al., 2021). The purpose of RME is to train and enhance students' skills in solving mathematical problems, as well as to provide new innovations for building students' conceptual understanding of mathematics and encouraging them to actively engage in discussions (Fitriyani et al., 2024; Rahmawati, 2022). The RME learning approach consists of four stages: (1) Situation: understanding everyday problems or contexts; (2) Model of: explaining contextual problems; (3) Model for: solving contextual problems; and (4) Formal Knowledge: concluding the problem (Heuvel-Panhuizen, 1996). Based on this explanation, RME is a teaching model that centers on practical, everyday problem linked to math concepts, enabling students to think creatively to find solutions.

One real-world context that can be used is the peatland context. This is because Central Kalimantan has approximately 2.65 million hectares of peatland, or 16.83% of its area (Sitinjak et al., 2022). Peatland is a natural resource in which the soil layer is composed of organic materials containing around 18% organic carbon, with a depth that can reach more than 50 cm (Alexandro et al., 2020). Peatland is also one of the areas where the process of absorbing large amounts of carbon dioxide ($CO_2$) occurs (Utomo, 2022). Based on this, the researcher chose peatland as the context because Kalimantan has the second-largest peatland area in Indonesia.

An RME-based electronic student worksheet in the context of peatland is an electronic worksheet containing questions that use real-world problems related to peatland, thereby providing information that encourages students to think creatively in solving problems and helps them become more familiar with the peatland environment (Augustha et al., 2021). Learning using RME-based student worksheet is chosen because the main characteristics that define RME align with the situations surrounding students and relate to problems that are commonly encountered and can be interpreted through students' thinking (Mardhiyana & Adna, 2023). Therefore, an RME-based electronic student worksheet in the context of peatland is a worksheet that applies the stages of RME based on real-world problems related to peatland.

The current situation in Indonesia requires learning that is technology-based and uses real-world contexts. This is supported as stipulated in the Regulation of the Minister of Education and Culture (Permendikbud) Number 47 of 2023, which mandates that learning implemented by educators must be technology-based and student-centered (Permendikbud No 47, 2023). Permendikbud Number 12 of 2024 states that the relevant principles of the New Learning Paradigm include learning

developed to suit the student's context, surroundings, and cultural background, and to include parents and the community as collaborators (Permendikbud, 2024). Previously, no RME-based electronic student worksheet in the context of peatland had ever been developed for mathematics learning, particularly for the Pythagoras Theorem topic. Therefore, this research can provide new insights.

From the explanation provided, it is essential for educators to use electronic worksheets designed to center on students that incorporate contexts related to students' surroundings, so that students' motivation and interest in learning can be improved. Therefore, the researcher will develop an RME-based electronic student worksheet supported by liveworksheet in the context of peatland for the Pythagoras Theorem topic at the junior high school level. This study seeks to determine how the developed electronic student worksheet can be utilized in mathematics learning.

## RESEARCH METHODS

The type of research conducted by the researcher is Research and Development (R&D). R&D research is a process used to develop and validate a product. The stages in the process include conducting an initial analysis concerning the product to be developed, creating the product, testing the product in the environment where it will be used, and then revising the product based on deficiencies found during the trial phase so that the development goals can be achieved (Gall et al., 2002). The purpose of R&D method is to produce a new product or improve an existing one to enhance the quality of learning through innovation (Judijanto et al., 2024). Based on this, R&D is a process carried out by researchers to develop a new product or improve an existing one, where the developed product must undergo validation testing and field testing to obtain information confirming that the product is beneficial in increasing learning effectiveness and efficiency.

The R&D method has several models, but the ADDIE model is the most suitable for developing an electronic student worksheet. This is because the ADDIE model has a more systematic workflow, making it more effective for developing electronic student worksheet (Lestari, 2022). The ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) is a traditional and general method used by developers to design learning and training programs (Setiadi & Yuwita, 2020). The ADDIE model originates from the concepts of instructional design and theories used by the U.S. Army in the 1950s. It was first developed by Reiser and Mollanda in 1967, and later Florida State University expanded its use in 1975 in the field of Educational Technology so that all U.S. military branches could apply it to produce high-quality soldiers. The ADDIE model was further developed by Dick and Carey and consists of five stages: (1) Analysis: identifying the topic to be taught, determining learning goals, selecting subject matter, and ensuring suitability for the target learners; (2) Design: planning and deciding the design according to learners' needs; (3) Development: developing the learning materials; (4) Implementation: applying the developed learning materials; and (5) Evaluation: assessing learners' knowledge progress and the quality of the learning materials (Hidayat, 2021; Pitriani et al., 2021; Sahaat et al., 2020). Figure 1 is a diagram of the ADDIE research method.

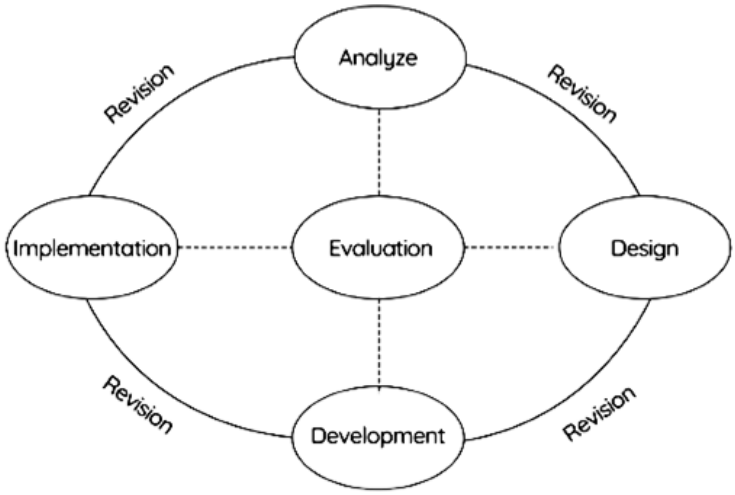


Figure 1. ADDIE Method Diagram (Branch, 2009)

The researcher only used four stages to assess the developed product's validity and practicality. Table 1 provides a general explanation of the four ADDIE stages and the data-gathering techniques applied in this research.

Table 1. Stages of the ADDIE Model (Rusdi, 2018).

| Stage | Description | Evaluation |
|---|---|---|
| Analysis | The analysis stage will be carried out through observation or interviews to identify problems as a guide for determining the learning material. To obtain the data, the researcher conducted observations at three junior high schools in Palangka Raya and interviewed three students with different ability levels, one mathematics teacher, and one vice principal in charge of curriculum. | After obtaining the data from that stage, the researcher conducted evaluation and revisions to refine the data. |
| Design | In the design stages, researcher to determine the material, set the learning objectives, and create a prototype or initial draft of the product. | Next, the material, objectives, and the electronic student worksheet prototype will be evaluated and revised. |
| Develop-ment | In the development stage, the researcher will develop the product based on the prototype design created in the design stage, followed by a validation test conducted by two validators. The validation test includes assessing the feasibility of the content/material, the visual appearance, and the language. | After the product is developed, it will be evaluated through a validity test and then revised again to produce a more refined product. |

(*continued on next page*)

Table 1. (*continued*)

| | | |
|---|---|---|
| Implementation | The researcher will implement the product in the field on a small scale to observe students' responses after using the product as a practicality test. | After obtaining the data from the electronic student worksheet trial, the researcher will carry out evaluation and revisions so that the electronic student worksheet becomes usable. |

Grounded in the Table 1, the data obtained in this study can be collected using validation sheets, response questionnaires, observations, and interviews. The validation sheets and response questionnaires produce numerical data collected through a Likert scale with an interval of 1–5 (Harwanto et al., 2025), as shown in Table 2.

Table 2. Guide to Scoring the Likert Scale

| Score | Description |
|---|---|
| 5 | Excellent |
| 4 | Good |
| 3 | Fair |
| 2 | Poor |
| 1 | Verry Poor |

The assessment results from the validation sheet and response questionnaire can be presented in the form of percentages to identify the levels of feasibility and practicality of the product that has been develop. Table 3 are the criteria of feasibility and practicality (Saputri & Reinita, 2025).

Table 3. Criteria for the Practicality and Feasibility of the Electronic Student Worksheet

| Score Weight | Criteria | Percentage Range |
|---|---|---|
| 5 | Very practical/very feasible | 81-100 |
| 4 | Practical/feasible | 61-80 |
| 3 | Less practical/less feasible | 41-60 |
| 2 | Not practical/not feasible | 21-40 |
| 1 | Highly impractical/highly unfeasible | 0-20 |

Based on the results of the interviews and observations, the researcher selected one school as the site for product testing. The school was chosen because it had not yet used an RME-based electronic student worksheet in the context of peatlands in its learning process. In addition, the selected school aligns with the product qualifications, allowing the product to be implemented there.

## RESULTS AND DISCUSSION

The outputs obtained through the application if the ADDIE model's four stages in developing an RME-based electronic student worksheet within the context of peatlands for the Pythagoras theorem material will be discussed according to each stage as follows.

The first stage is analysis. The initial phase of the process is the analysis stgae that involves conducting a needs analysis, an analysis of learner's characteristics, an analysis of prerequisite skills and prior knowledge, as well as an analysis of the learning environment (Rusdi, 2018). The analysis stage is carried out through observations and interviews to identify problems in the field as a basis for determining the learning material and objectives. Observations and interviews were conducted at three junior high schools in Palangka Raya, selected based on the schools' accreditation levels—high, medium, and low (Purnasari et al., 2022). The results of the observations and interviews indicated that junior high schools in Palangka Raya rarely use the RME approach in learning and have never used peatland contexts or electronic student worksheet assisted by liveworksheet. Furthermore, the researcher identified the problems found in the field so that in the next stage, the researcher could determine the learning material and objectives to be achieved. The Pythagoras theorem is considered a topic that is quite difficult for students to understand. This is because students still struggle to identify the opposite side, hypotenuse, and adjacent side of a right triangle. In addition, students have not yet fully understood Pythagoras triples or the steps for applying the Pythagoras formula. Therefore, in the next stage, the researcher can determine the appropriate learning material and objectives to be achieved.

The second stage is analysis design. The design stage aims to verify the desired performance using the appropriate testing methods**.** In this stage, the researcher determines the learning material and verifies the expected learning outcomes in the form of learning objectives, as well as identifies the strategies or methods that align with students' needs (Yafi et al., 2025). Based on the results from Stage 1, the researcher selected the Pythagoras theorem as the learning material, with the following learning objectives: (1) Identify the definitions of the opposite side, adjacent side, and hypotenuse of a right triangle; (2) Prove the Pythagoras theorem by creating a scheme or procedure; (3) Identify Pythagorean triples and determine the length of sides in right triangles using the Pythagoras theorem; and (4) Solve contextual problems. Next, the researcher developed the initial prototype of the electronic student worksheet to be further refined. Figure 2 shows the initial draft of the electronic student worksheet.

The third stage is Development. At the development stage, the researcher conducted a validation process by giving validation sheets to two validators. The results of the expert validation serve as a benchmark for determining the feasibility of the product (Lestari et al., 2025). The validation was implemented to determine the feasibility level of the online student worksheet that would be developed and implemented in the classroom. The validation process was conducted by giving validation sheets to two validators, namely Muhammad Rizaldi, M.Pd., a Mathematics Education lecturer who teaches Mathematics Problem Solving and Algebra courses, and Siti Dian Anugrah, M.Pd., a Mathematics Education lecturer who teaches Microteaching as well as Planning and Development of Mathematics Learning Programs. The validation sheet also included a comment section where

validators could provide feedback on the product. The validation outcomes of the product as shown in Table 4.

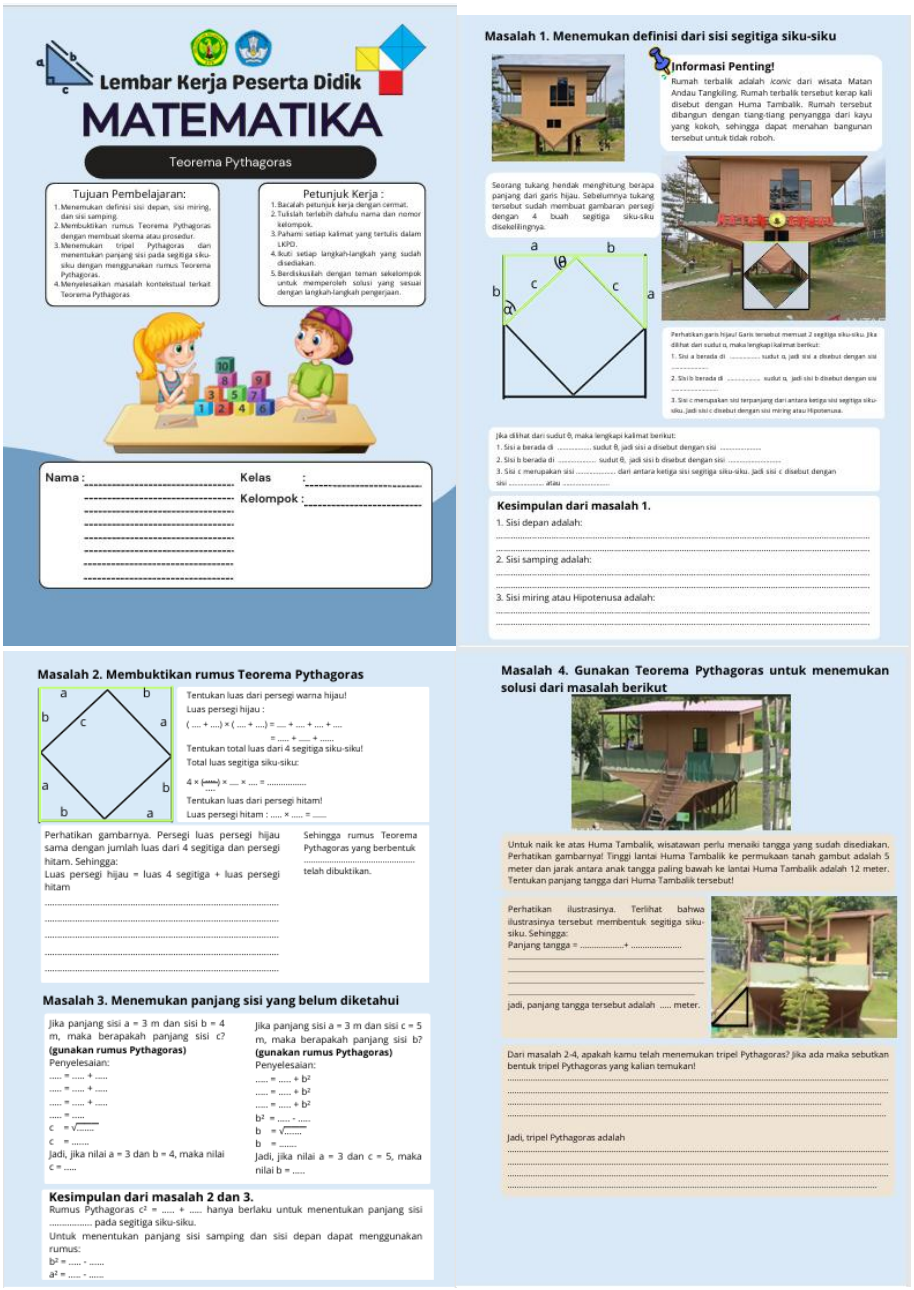


Figure 2. Initial Draft of the Electronic Student Worksheet

Based on Table 4, the assessment from the first validator ranged from 86% to 95% with an average of 91%, falling under the “very feasible” criteria. However, the developed electronic student worksheet still required revisions based on the validator’s suggestions, specifically in the problem-solving section, where algebraic formulas should not be used immediately; instead, contextual sentences should be employed to foster students’ understanding. After making these minor revisions, the electronic student worksheet became usable.

Table 4. Results of Validation from the First Validator

| Assessment Aspect | Percentage (%) | Criteria |
|---|---|---|
| Content/Material Feasibility | 95 | Very feasible |
| Design | 93 | Very feasible |
| Language | 86 | Very feasible |
| Average | 91 | Very feasible |

Based on Table 5, the assessment from the validator ranged from 80% to 86% with an average of 82%, falling under the "feasible" to "very feasible" criteria. Before implementing the electronic student worksheet, some sections needed revision, specifically in the square diagram section, where equal-side symbols should be used for each side so that students can recognize the figure as a square. After making these minor revisions, the electronic student worksheet became suitable for use. Figure 3 is images of the revised worksheet, ready to be used for a small-scale trial.

Table 5. Results of Validation from the Second Validator

| Assessment Aspect | Percentage (%) | Criteria |
|---|---|---|
| Content/Material Feasibility | 80 | Feasible |
| Design | 86 | Very feasible |
| Language | 80 | Feasible |
| Average | 82 | Very feasible |

The fourth stage is implementation. It is the activity of field-testing the product with the aim of obtaining students' responses after using the product. Implementation can be carried out on a limited sample, for example through a one-to-one trial or a small group trial (Rusdi, 2018). Students responses are collected using questionnaires based on their experiences after using the electronic student worksheet. The response questionnaire used by the researcher was adopted from previous studies that had already developed and validated student response questionnaires. This study used a small group trial, involving 30 students as the target for the product trial. After conducting the product trial, the researcher distributed response questionnaires to both the students and the teacher. Table 6 summarizes the responses from them.

Based on Table 6, the teacher's assessment ranged from 86% to 92% with an average of 89%, falling under the "very practical" criteria. The teacher stated that by using the electronic student worksheet, students became more enthusiastic and motivated in learning.

Grounded in the Table 6, students' responses ranged from 78% to 98%, with an average of 88%, falling into the practical and very practical categories. Some students provided suggestions regarding the electronic student worksheet, such as the electronic student worksheet should be conducted over two sessions so that there is enough time to complete the problems. In addition, some students felt they better understood the concept of the Pythagoras theorem after completing the problems in the electronic student worksheet. However, some students still experienced difficulties. Based on interviews with students facing difficulties, they encountered challenges in finding the square root of a number.

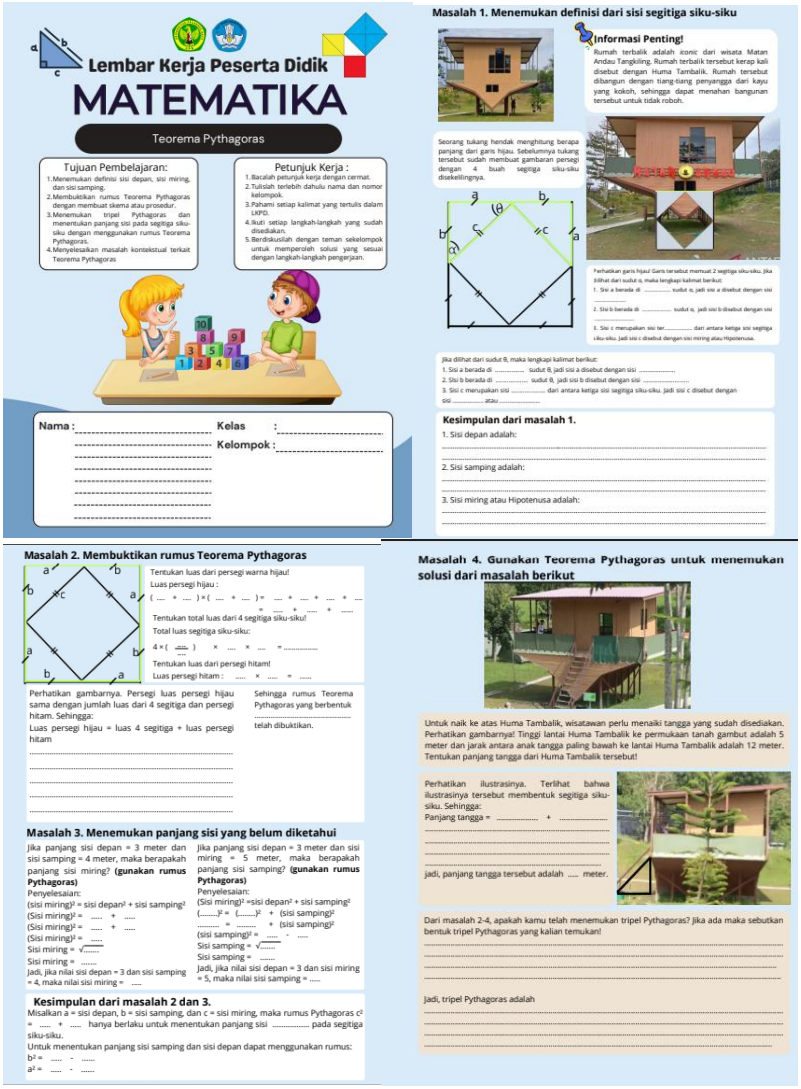


Figure 3. Revised Student Worksheet

According to the response questionnaire, 23 students felt that their interest in learning increased by using the researcher-developed electronic student worksheet; 20 learner stated that the learning was engaging; 28 students stated that the information in the problems was very clear; 30 students stated that the electronic student worksheet display was very attractive; 25 students stated that mathematics learning became interesting; 28 students stated that the electronic student worksheet utilized language that was easy for students to grasp; 20 students stated that with the electronic student worksheet, they could learn independently; 30 students stated that the electronic student worksheet could be used at any time, and the peatland context could increase curiosity in learning.

Table 6. Teacher's Response to the Electronic Student Worksheet

| Assessment Aspect | Percentage (%) | Criteria |
|---|---|---|
| Content/Material Feasibility | 92 | Very Practical |
| Design | 86 | Very Practical |
| Language | 88 | Very Practical |
| Average | 89 | Very Practical |

Grounded in the description, the application of the ADDIE model in producing the RME-based electronic student worksheet on peatland-context Pythagoras theorem material proves that the product is both valid and practical. Thus, the electronic student worksheet is suitable for implementation in mathematics instruction. It can be accessed through Liveworksheets via the following link: https://www.liveworksheets.com/c?a=a&t=xp4wgre7fA&sr=n&l=up&i=odxdfst&r=zs&f=dzdfuudu&ms=uz&cd=dmh9ubsr3e-lxhjnmnepzgpngnexxnxxg&mw=hs.

Table 7. The Students' Responses to the Electronic Student Worksheet

| Students Initials | (%) | Criteria | Students Initials | (%) | Criteria |
|---|---|---|---|---|---|
| AA | 80 | Practical | JA | 98 | Very Practical |
| AS | 78 | Practical | JE | 93 | Very Practical |
| AV | 92 | Very Practical | KT | 88 | Very Practical |
| B | 78 | Practical | KO | 96 | Very Practical |
| BA | 85 | Very Practical | M | 82 | Very Practical |
| B | 83 | Very Practical | MA | 95 | Very Practical |
| CT | 90 | Very Practical | N | 84 | Very Practical |
| DAL | 78 | Practical | OS | 84 | Very Practical |
| DT | 95 | Very Practical | R | 98 | Very Practical |
| FT | 90 | Very Practical | RW | 80 | Practical |
| GS | 90 | Very Practical | SO | 98 | Very Practical |
| GZ | 88 | Very Practical | T | 88 | Very Practical |
| HC | 93 | Very Practical | VA | 86 | Very Practical |
| HK | 78 | Practical | VK | 98 | Very Practical |
| I | 90 | Very Practical | ZA | 80 | Practical |
| | | Average | | 88 | Very Practical |

## CONCLUSION

The development of the electronic student worksheet which is grounded in the ADDIE model can be considered valid and practical for implementation in mathematics instruction, particularly on the Pythagoras theorem material for 8th-grade junior high school students. The electronic student worksheet was developed to address a problem occurring in schools, namely students having difficulty understanding the material using conventional learning methods. It is recommended that future researchers use this electronic student worksheet for large-scale trials. In addition, future researchers can also use the electronic student worksheet to evaluate the practicality of the product over the years.

## ACKNOWLEDGMENT

The researcher expresses sincere thanks to all contributors to this study, especially FKIP UPR. The researcher also extends thanks to the journal's editorial team for kindly accepting this manuscript.

## REFERENCES

Alexandro, R., Okada, A. F., Pardosi, E., Makaruehni, J., & Sari, A. (2020). Media

Pembelajaran Daring Menggunakan Metode Memberi Edukasi Tentang Kawasan Tanah Gambut Di Sman 10 Petuk Katimpun Online Learning Media Using Demonstration Method in Geographic Lessons To Give Education About Peat Area in SMAN 10 Katimpun. *Jurnal Pengabdian Kepada Masyarakat*, *1*(2), 64–72.

Angraini, L. M., & Muhammad, I. (2023). Analisis Bibliometrik: Tren Penelitian RME dalam Pembelajaran Matematika selama Pandemi. *Jurnal Nasional Pendidikan Matematika*, *7*(2), 224. https://doi.org/10.33603/jnpm.v7i2.7817

Apriyantini, N. P. D., & Sukendra, I. K. (2023). Penerapan Pembelajaran Berdiferensiasi Berbantuan E-LKPD untuk Meningkatkan Keaktifan Belajar Matematika Siswa. *Jurnal Pendidikan (Widyadari)*, *24*(1), 55–63. https://doi.org/10.5281/zenodo.7813406

Augustha, A., Susilawati, S., & Haryati, S. (2021). Pengembangan E-LKPD Berbasis Discovery Learning Menggunakan Aplikasi Adobe Acrobat 11 Pro Extended pada Materi Kesetimbangan Ion dan pH Larutan Garam untuk Kelas XI SMA/MA Sederajat. *Journal of Research and Education Chemistry*, *3*(1), 28. https://doi.org/10.25299/jrec.2021.vol3(1).6485

Azizah, A. N., Arrindha, N., Suwana, C. A., & Rofiki, I. (2024). Profil Pengelolaan Kelas Guru Matematika SMP dengan Sistem Blok pada Materi Teorema Pythagoras. *Suska Journal of Mathematics Education*, *10*(1), 25–38.

Bela, N., & Ferawaty, L. (2023). Pelatihan Pembuatan E-LKPD Melalui Liveworsheets dan Canva di SMPN 3 Merauke. *Jubaedah : Jurnal Pengabdian Dan Edukasi Sekolah (Indonesian Journal of Community Services and School Education)*, *3*(1), 14–24.

Branch, M. R. (2009). *Intstructional Design: The ADDIE Approach*. Spinger Science+Busines Media.

Dahari, D. R., Sylvia, I., & Yolanda, M. N. (2024). Pengembangan E-LKPD Sosiologi Berbasis Multimedia Untuk Peserta Didik Kelas XI IPS SMAN 2 Painan. *Naradidik: Journal of Education and Pedagogy*, *3*(2), 156–167. https://doi.org/10.24036/nara.v3i2.210

Firtsanianta, H., & Khofifah, I. (2022). Efektivitas E-LKPD Berbantuan Liveworksheets Untuk Meningkatkan Hasil Belajar Peserta Didik. *Conference of Elementary Studies*, 140–147.

Fitriyani, Isrok'atun, & Sunaengsih, C. (2024). Penerapan Pendekatan RME Berbantuan Media Puzzle terhadap Kemamuan Pemecahan Masalah Matematis Peserta didik Kelas II di Sekolah Dasar. *Jurnal Basicedu*, *8*(3), 3(2), 524–532.

Gall, M. D., Gall, J. P., & Borg, W. R. (2002). *Educational Research An Intruduction* (7th ed.). Allyn and Bacon.

Harwanto, A. P., Putri, S. S., Yulingga, S. D., Amin, N., & Asfari, B. (2025). Validitas dan Reliabilitas Skala Kesepian. *Jurnal Flourishing*, *5*(1), 48–57. https://doi.org/10.17977/10.17977/um070v5i12025p48-57

Hered, F., Bentri, A., Fauzan, A., & Fitria, Y. (2021). Pengembangan Local Intstructional Theory Topik Perbandingan Berbasis Pendekatan RME di Sekolah Dasar. *Jurnal Basicedu*, *5*(5), 3(2), 524–532.

Heuvel-Panhuizen, M. Van Den. (1996). Assesment and realistic mathematic education. In *Encyclopedia of Mathematics Education* (Issue January 1996). https://doi.org/10.1007/978-94-007-4978-8

Hidayat, F. (2021). Model ADDIE (Analysis, Design, Development,

Implementation and Evaluation) dalam Pembelajaran Pendidikan Agama Islam. *Jurnal Inovasi Pendidikan Agama Islam (JIPAI)*, *1*(1), 28–38.

Hurrahma, M., & Sylvia, I. (2022). Efektivitas E-LKPD Berbasis Liveworksheet dalam Meningkatkan Hasil Belajar Sosiologi Peserta Didik di Kelas XI IPS SMA N 5 Padang. *Jurnal Sikola: Jurnal Kajian Pendidikan Dan Pembelajaran*, *4*(1), 14–22. https://doi.org/10.24036/sikola.v4i1.193

Inayah, H., Prabawati, M. N., & Ratnaningsih, N. (2024). Hypothetical Learning Trajectory (HTL) Terhadap Kemampuan Penalaran Matematis pada Materi Teorema Pythagoras. *Jurnal Penelitian Pembelajaran Matematika Sekolah*, *8*(2), 258–267. https://doi.org/https://doi.org/10.33369/jp2ms.8.2.258-267

Indriani, F. F., & Sakti, N. C. (2022). Pengembangan E-LKPD Berbasis Komik untuk Meningkatkan Kemampuan Berpikir Kritis Peserta Didik Kelas XI IPS SMA. *Jurnal PTK Dan Pendidikan*, *8*(1), 65–77. https://doi.org/10.18592/ptk.v8i1.6414

Iskandar, A., Winata, W., Kurdi, M. S., Sitompul, P. H. S., Kurdi, M. S., Nurhayati, S., Hasanah, M., Arisa, M. F., & Haluti, F. (2023). *Peran Teknologi Dalam Dunia Pendidikan*. Cendekiawan Inovasi Digital Indonesia.

Judijanto, L., Muhammadiah, M., Utami, R. N., Suhirman, L., Laka, L., Boari, Y., Lembang, S. T., Wattimena, F. Y., Astriawati, N., Laksono, R. D., & Yunus, M. (2024). *Metodologi Research and Development: Teori dan Penerapan Metodologi RnD*. PT. Sonpedia Publishing Indonesia.

Lestari, A. B. (2022). Pengembangan Media Pembelajaran Lembar Kerja Peserta Didik Elektronik ( E-Lkpd ) Berbasis Web Liveworksheet di SMAN 5 Metro. *Pendidikan Ekonomi*, *1*(1), 39–50.

Lestari, S. T., Uswatun, D. A., & Sutisnawati, A. (2025). Pengembangan Instrumen Penilaian Kognitif Siswa Berbasis STEM EDP pada Mata Pelajaran IPA di Sekolah Dasar. *Jurnal Kependidikan*, *14*(1), 813–826.

Maharani, D., Helmiah, F., & Rahmadani, N. (2021). Penyuluhan Manfaat Menggunakan Internet dan Website Pada Masa Pandemi Covid-19. *Jurnal Pengabdian Masyarakat Informatika*, *1*(1), 1–7. https://doi.org/10.25008/abdiformatika.v1i1.130

Mardhiyana, D., & Adna, S. (2023). Penerapan RME Berbasis Budaya Pekalongan Terhadap Kemampuan Pemahaman Konsep Mahasiswa pada Mata Kuliah Statistika. *Jurnal Matematika Dan Pendidikan Matematika*, *14*(2), 90–98.

Murtalib, M., Gunawan, G., & Syarifuddin, S. (2022). Pengembangan Lembar Kerja Mahasiswa Elektronik (E-LKM) Interaktif Berbantuan Live Worksheet pada Perkuliahan Daring. *Supermat (Jurnal Pendidikan Matematika)*, *6*(2), 130–145. https://doi.org/10.33627/sm.v6i2.918

Noormiati, N., Zaini, M., & Karim, K. (2023). Desain Dan Uji Coba E-Lkpd Ipa Menggunakan Liveworksheet Untuk Meningkatkan Keterampilan Berpikir Kritis. *Journal of Banua Science Education*, *3*(2), 127–134. https://doi.org/10.20527/jbse.v3i2.169

Permendikbud. (2023). *Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia Nomor 47 Tahun 2023 tentang Standar Pengelolaan pada Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, dan Jenjang Pendidikan Menengah.No Title*.

Permendikbud. (2024). *Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia Nomor 12 Tahun 2024 tentang Kurikulum pada*

*Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, dan Jenjang Pendidikan Menengah*.

Pitriani, N. R. V., Wahyuni, I. G. A. D., & Gunawan, I. K. P. (2021). Penerapan Model ADDIE Dalam Pengembangan Media Pembelajaran Interaktif Menggunakan Lectora Inspire Pada Program Studi Pendidikan Agama Hindu. *Jurnal Ilmu Pendidikan*, *4*(3), 515–532. https://doi.org/10.37329/cetta.v4i3.1417

Purnasari, P. D., Silvester, Dimmera, B. G., Manulang, R., & Wulandari, D. (2022). Pengembangan Instrumen Pengukuran Tingkat Kesiapan Digitalisasi Pembelajaran Sekolah Dasar Ditinjau Dari Perspektif Pendidik Dan Peserta Didik Wilayah Perbatasan. *Sebatik*, *26*(2), 725–731. https://doi.org/10.46984/sebatik.v26i2.1977

Rahmawati, R. (2022). Concept and Implementation of the Realistic Mathematics Education (RME) Approach in Mathematics subjects. *SHEs: Conference Series*, *5*(5), 1223–1229.

Rusdi, M. (2018). *Penelitian Desain dan Pengembangan Kependidikan*. PT. Raja Grafindo Persada.

Sahaat, Z., Nasri, N. M., & Bakar, A. Y. A. (2020). *ADDIE Model In Teaching Module Design Process Using Modular Method: Applied Topics in Design And Technology Subjects*. *464*(Psshers 2019). https://doi.org/10.2991/assehr.k.200824.161

Saputri, W., & Reinita. (2025). Pengembangan E-LKPD Berbasis Canva dalam Pembelajaran Pendidikan Pancasila Elemen Nilai-Nilai Pancasila Kelas IV Sekolah Dasar. *Jurnal Karya Ilmiah Guru*, *10*(1), 333–341. https://doi.org/https://doi.org/10.51169/ideguru.v10i1.1494

Sari, P. P., & Amir MZ, Z. (2021). Pengembangan Lembar Kerja Siswa (LKS) Berbasis Model Pembelajaran Realistic Mathematic Education (RME) Pada Materi Bangun Ruang Sisi Datar. *JURING (Journal for Research in Mathematics Learning)*, *4*(3), 269. https://doi.org/10.24014/juring.v4i3.14024

Setiadi, G., & Yuwita, N. (2020). Pengembangan Modul Mata Kuliah Bahasa Indonesia Menggunakan Model ADDIE bagi Mahasiswa IAI Sunan Kalijogo Malang. *Jurnal Manajemen Pendidikan Islam*, *2*(2), 200–217. https://doi.org/10.51339/akademika.v2i2.207

Setiawan, E., Juita, S., Putra, B. B. P., & Utomo, B. (2021). Pengembangan Media Pembelajaran Video Animasi Stop Motion Pada Teorema Phytagoras Materi Perbandingan Panjang Sisi Segitiga-segitiga Khusus Kelas VII di SMPN 2 Mlati. *Prosiding SENDIKA*, *7*(2), 229–240.

Siregar, E. K. B., & Padli, M. I. (2023). Peran Internet dalam Pendidikan di Era Digital. *Jurnal Media Akademik*, *3*(1), 14–16. https://doi.org/10.62281

Sitinjak, B., Yulianti, N., Damanik, Z., & F. Adji, F. (2022). Pembaharuan Kajian Sifat Fisik Lapisan Acrotelm dan Catotelm Beberapa Tutupan Lahan Gambut Pedalaman di Kalimantan Tengah. *Jurnal Penelitian UPR*, *2*(1), 6–19. https://doi.org/10.52850/jptupr.v2i1.4263

Suryandari, Y., Hendrayan, A., & Hariyadi, R. (2023). Pengembangan Media E-LKPD Berbasis Live Worksheet Untuk Meningkatkan Kemandirian Belajar Siswa Pada Mata Pelajaran Pendidikan Agama Islam. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *08*(Desember), 700–707.

Tanaka, A., Gani, R. A., Andani, F., Martini, E., Udin, T., Firmansyah, Surahmi,

N., Wewe, M., & Oreza, R. (2023). *Perencanaan Pembelajaran*. Selat Media.

Utomo, A. P. (2022). Etimasi Sebaran Kawasan Lahan Gambut (Peat Land) Menggunakan Citra Satelit Landsat 8 Oli Tirs. *Jurnal Sains Benuanta*, *1*(2), 22–29.

Yafi, S., Nelwati, S., Kosim, M., Sari, M., & Hasnah, R. (2025). Kebutuhan Pengembangan E-MODUL Berbasis Berdiferensiasi Mata Pelajaran Al-Qur'an Hadis Madrasah Tsanawiyah. *Jurnal Review Pendidikan dan Pengajaran*, *8*(1), 2655–6022.

Yestina, R., & Ratnaningsih, N. (2023). Problematika Pembelajaran Matematika di Madrasah Aliyah pada Era Post-Pandemic Covid-19. *Indonesian Journal of Action Research*, *2*(2), 237–250. https://doi.org/10.14421/ijar.2023.22-10