

Implementation of Wizer.me Based E-LKPD for Science Learning on Digital Literacy Activities in Elementary School

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Abstract: This study aims to develop and implement an interactive electronic Learner Worksheet (E-LKPD) utilizing the Wizer.me application for science education, specifically targeting digital literacy activities in elementary schools. It also aims to evaluate the effectiveness of this E-LKPD in enhancing the critical thinking skills of sixth-grade students. The research adopts a Research and Development (R&D) approach employing the ADDIE model, encompassing the phases of analysis, design, development, implementation, and evaluation. The study involved 27 sixth-grade students and 2 teachers from a public elementary school located in Malang City. Validation by material experts resulted in a total score of 37 out of 45, translating to 82%, which falls into the very high category. Meanwhile, media expert validation yielded a total score of 55 out of 70, corresponding to 79% in the high category. The trial results, along with student feedback, indicated that the E-LKPD is highly feasible for use and significantly enhances student engagement and comprehension through interactive features such as illustrated quizzes and explanatory videos. An analysis of pretest and post-test data demonstrated a notable improvement in students' critical thinking skills regarding Outer Space Object material, with an average score increase of 22.19%. These findings indicate that the Wizer.me-based E-LKPD serves as an effective interactive learning medium, supporting science education and reinforcing digital literacy in elementary schools.

Keywords: Critical thinking; E-LKPD; Outer space objects; Science learning; Wizer.me

Introduction

Information and communication technology (ICT) has transformed the landscape of education, necessitating that educators adapt to changes in teaching and learning processes. Digital literacy has emerged as one of the fundamental skills that both students and educators must acquire in the contemporary era (Alenezi et al., 2023; Ghory & Ghafory, 2021). Digital literacy goes beyond merely using the available technologies; it includes evaluating information,

thinking systemically, and acting responsibly while accessing, controlling, or navigating through the digital space (Buchan et al., 2024; Reddy et al., 2023).

Digital literacy can be utilized to enhance more engaging teaching and learning experiences by incorporating a range of digital tools and resources (Alakrash & Abdul Razak, 2021; Nikou et al., 2022). Multiple studies indicate that the growing level of digital literacy is associated with improvement in learning, enhanced student engagement, and enhanced

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thinking skills at higher levels (Holm, 2025; Kim et al., 2020; Liu & Zhang, 2022).

Regardless, the implementation of digital learning is still faced with numerous challenges, particularly in learning design which lacks the systematic development of digital literacy (Meridha, 2024; Tay et al., 2022). Research demonstrates that primary school teachers continue to struggle with the use and access of technology, including tools and applications that enable the creation of relevant and engaging literacy materials that are grade appropriate (Crompton et al., 2021; Hébert et al., 2021; Hennessy et al., 2022). As these students are beginning to attend school, it becomes mandatory for educators to understand, master, and adapt to technology to fulfill the data literacy and technological competencies required. The importance of having information retrieval analysis skills becomes an additional challenge (Audrin & Audrin, 2022; Vodă et al., 2022). For these reasons, it creates both a challenge and an opportunity for educators and curriculum developers to create learning materials in accordance with 21st century standards.

Teachers can enhance students' digital literacy by designing Learner Worksheets (LKPD) using the Wizer.me platform. Previous studies have demonstrated the successful development of LKPD on Wizer.me, yielding valid, practical, and effective outcomes in social arithmetic materials, making it particularly suitable for use in learning environments, especially online (Maharani & Hidayah, 2024). An investigation into the application of Wizer.me and Socrative as innovative teaching methods, integrating TPACK (Technological Pedagogical Content Knowledge) and Social Learning Theory in a Cross-Cultural Management course, revealed that students, although initially unfamiliar with these tools, had become proficient by the end of the semester and provided positive feedback regarding their effectiveness in enhancing the teaching and learning experience (Kaliappen et al., 2021). Moreover, Wizer.me has demonstrated its effectiveness as a gamified platform for teaching English as a Foreign Language (EFL) vocabulary. Its linguistic and didactic potential is examined through an algorithm that employs gamified techniques to foster an immersive learning environment. This platform offers features such as customizable worksheets, interactive lessons, automated assessment and feedback, collaborative tools, and comprehensive analytics. Together, these elements enhance student engagement, motivation, retention, and vocabulary usage among students in Bachelor's degree programs (Osipova & Bagrova, 2023).

The difference between this research and previous research is that it concentrates on developing LKPD Worksheets to improve critical thinking skills in

elementary school science education. The creation of fundamental literacy activities Wizer.me based worksheets assists not only in solving contemporary educational issues, but also helps towards fulfilling the Sustainable Development Goals (SDGs) in terms of quality education (Goal 4). The objective of this research is to develop Wizer.me digital literacy enhancing worksheets and evaluate their effectiveness and practicality in fostering students' critical thinking skills.

With respect to these goals, the outcome of this research is aimed to be of great help to classroom teachers, university lecturer, and instructional developers. The study is hoped to contribute towards the use of innovative and contextual teaching and learning approaches that would give sustainable digital literacy development to students in preparation for the digital era.

Method

This study used the Research and Development (R&D) methodology along with the ADDIE development model which has five steps including analysis, design, development, implementation, and evaluation (Branch, 2009). The study was carried out in one of the public primary schools located in Malang City. The sampling subjects for this study consisted of 27 students from grade VI and 2 teachers of science. Figure 1 illustrates the research flow chart using the ADDIE model.

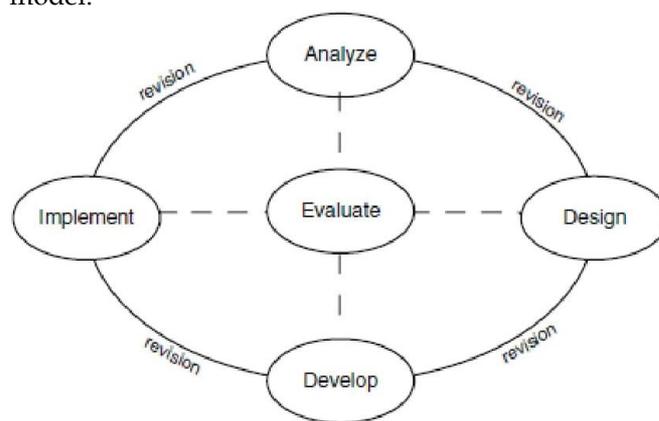


Figure 1. State of ADDIE model

The analysis stage, namely identifying the needs of students and teachers for interactive learning media. The design stage, namely designing electronic Learner Worksheets using Wizer.me with content according to the Merdeka Curriculum. The development stage, namely the manufacture and validation of E-Learners' Worksheets by material and media experts. The implementation stage, namely the trial of the Learner's E-Work Sheet in the classroom learning process. The

evaluation stage, namely evaluating the achievement of learning objectives and student responses.

Data collection techniques used in this study, namely using observation, tests, questionnaires, and interviews. The data analysis technique is descriptive statistics, namely finding the percentage of test results obtained by students (Maharani & Hidayah, 2024). While the level of validity of the results of material and media expert validation and filling out student response questionnaires refers to the following table.

Table 1. Validity Category

Category	Percentage %
Very Low	0-20
Low	21-40
Moderate	41-60
High	61- 80
Very High	81-100

Source: Rahardja, Sudaryono, & Chakim (2023)

Results and Discussion

Result

The results of this study refer to the ADDIE model. At the analysis stage, identifying the needs of students and teachers for interactive learning media. Before developing the product, researchers conducted field observations and interviews with several grade 6 elementary school teachers. Field observation activities were carried out in one of the elementary schools in Malang city. The purpose of the field observation was to observe the process of teaching and learning activities ranging from teacher preparation to the utilization of student worksheets for students. The results of field observations show that the teacher has prepared well before starting the learning process, this is shown when students begin to line up into the classroom and carry out morning habituation (singing the Indonesia Raya song, Pancasila, and praying) followed by the teacher asking for news and conducting student attendance. After the habituation activities, the teacher starts the core activities by motivating the students. At the end of the learning activity, the teacher instructs students to work on the Learner Worksheet found in the student book.

Researchers have also conducted interviews with several grade 6 teachers at 3 elementary schools in Malang City and 1 elementary school in Malang Regency. The interview results show that the learner worksheets used by teachers include: (1) student worksheets adapted from the independent curriculum student book, (2) homemade student worksheets in the form of paper or sheets that have been printed, and (3) student worksheets by utilizing Google Form and Quizizz. Each teacher has differences in the use of learner worksheets, but the purpose is the same, namely

to provide additional material (enrichment), practice questions, and assessments to measure students' understanding and progress in a topic or subject.

The design phase involves creating electronic student worksheets using Wizer.me, aligning the content with the Merdeka Curriculum. Following field observations and interviews, the electronic development of these worksheets is conducted. Researchers developed the e-learner worksheets utilizing the Wizer.me application. The primary aim of developing these electronic student worksheets is to enhance students' critical thinking skills, particularly concerning outer space objects. Additionally, the researchers noted a lack of interactive electronic student worksheets created with the Wizer.me application based on their observations and interviews. The initial product designed incorporates a systematic framework outlined during the development phase.

The development phase includes the creation and validation of the electronic learner worksheets by material and media experts, along with product trials. The electronic worksheets consist of several components: a cover page, instructions for completing the electronic learner worksheet, pre-learning activities, introductory tasks, core activities, and practice questions.

Cover

On the cover there is a title of the learner worksheet with additional information below it. The title of the learner worksheet is written specifically so that students can find out that the learner worksheet is used in the learning material and subjects that have been explained. The cover image can be seen in Figure 2.



Figure 2. Electronic learner worksheet cover

Instructions for filling out the e-learner worksheet

Instructions for filling out student worksheets are used to facilitate students in using electronic student worksheets. There are 2 kinds of instructions for filling out the electronic worksheet for students, including instructions for filling out student worksheets using a computer/laptop and instructions for filling out student worksheets using a cellphone. In the instructions for filling out the student worksheet there is a link which, if

clicked, will be directly connected to youtube, so that a video tutorial for filling out the student worksheet will be displayed. The display of filling out the learner worksheet can be seen in Figure 3.

Petunjuk pengisian LKPD:
 1. Menggunakan Komputer/Laptop
 Silahkan klik link berikut ini
https://youtu.be/6Q-LcG_Xma8?si=LOUw7kWrUtNolZ-w
 2. Menggunakan Handphone
 Silahkan klik link berikut ini
<https://youtu.be/-DzqlqWjcOg?si=E5zQvckRMFDC9sSj>

Figure 3. Instructions for filling out student worksheets

PreLearning

Before starting the initial activity, there is pre-learning. The purpose of pre-learning is to provide an overview of the learning material to be learned. In addition, there are also triggering questions to motivate students to have a passion for learning and critical thinking. The pre-learning display can be seen in Figure 4.

Pra Pembelajaran
 Manusia melakukan berbagai aktivitas saat siang hari, tak jarang ada beberapa orang yang juga melakukan aktivitas pada malam hari. Ketika siang hari, manusia akan lebih mudah melakukan aktivitas karena keadaan saat siang hari terang. Sedangkan pada saat malam hari, keadaan mulai gelap dan orang akan membutuhkan bantuan lampu sebagai penerangan.
 Mengapa hal tersebut dapat terjadi?

Figure 4. Pre-learning view on electronic learner worksheet

Initial Activity

In the early learning activities, students will be invited to observe the picture and answer some questions related to the picture. In this electronic worksheet, students will be invited to think critically by providing answers. Answers can be written in the form of text or voice recordings. The initial activity display can be seen in Figure 5.

MENGENAL SISTEM TATA SURYA



Gambar 1.1 Peristiwa malam hari
 Gambar 1.2 Peristiwa siang hari

Perhatikan kedua gambar di atas!
 Apakah perbedaan kedua gambar di atas?
 Benda langit apa saja yang kamu temukan pada kedua gambar di atas?

Figure 5. Display of the initial activity on the electronic learner worksheet

Core Activity

In the core activities, students will be presented with articles/readings related to the learning material. Students can read the article carefully and continue by viewing the learning video that has been prepared. Learning videos can be viewed by scanning the QR code or clicking on the existing link. The display of core activities can be seen in Figure 6 and Figure 7.

Bacalah artikel berikut dengan saksama!



Gambar 2.1 Galaksi Bima Sakti

Benda Langit di Sekitar Kita
 Alam semesta memiliki banyak galaksi dengan bentuk yang berbeda-beda. Galaksi adalah sekumpulan bintang yang terikat oleh gaya gravitasi. Galaksi terdiri atas planet-planet yang mengelilinginya. Galaksi Bima Sakti merupakan galaksi tempat tinggal manusia. Galaksi Bima Sakti berbentuk spiral. Di dalamnya terdapat benda langit yang sangat banyak. Di dalam galaksi Bima Sakti terdapat sistem tata surya kita. Tata surya kita terdiri atas delapan planet yang mengelilingi matahari. Selain planet dan matahari, sistem tata surya juga terdiri atas satelit, asteroid, dan komet. Mari kita lihat lebih dekat sistem tata surya kita!

Figure 6. Display of core activities on electronic learner worksheets

Audio Question

Silahkan tekan tombol  di atas untuk mendengarkan instruksi/pertanyaan!



Pindai QR Code

Apabila mengalami kesulitan untuk memindai QR Code di atas silahkan klik link berikut ini!
https://youtu.be/oV_f_vAnfbk?feature=shared

Figure 7. QR code display on electronic learner worksheet

Practice Questions

After students carry out a series of learning activities, then students will be given practice questions in various types. The types of problem exercises include: picture filling questions; sorting questions; table filling questions; multiple choice questions; matching questions; and drawing questions. These types of questions have their respective scores according to the criteria. The display of the exercise questions can be seen in Figure 8 – 13.

Tata surya kita terdiri dari delapan planet. Kedelapan planet tersebut mengelilingi matahari sebagai pusatnya. Setiap planet dalam tata surya kita memiliki ciri dan keunikan masing-masing. Sebelum kita membahas ciri dan keunikan dari planet-planet yang ada dalam sistem tata surya kita, mari kita isi nama-nama planet di bawah ini!

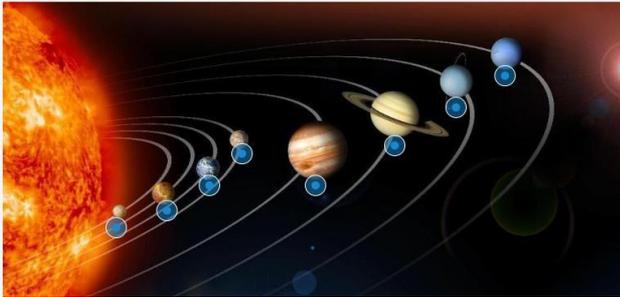


Figure 8. Display of picture filling questions on electronic learner worksheets

Setelah mengetahui nama-nama planet, selanjutnya kelompokkan planet-planet tersebut yang termasuk planet dalam dan planet luar!

Planet Dalam	Planet Luar
Merkurius	Jupiter
Venus	Saturnus
Bumi	Uranus
Mars	Neptunus

Figure 9. Display of sorting questions on electronic learner worksheets

Berdasarkan bacaan di atas, tuliskan informasi penting yang kamu dapatkan pada tabel berikut!

Nama Benda Langit	Karakteristik
Matahari	Suhu di permukaannya hampir 6000 derajat celsius. Suhu inti Matahari mencapai 15.000.000 derajat celsius.
Merkurius	Keunikan dari Merkurius adalah melesat cepat mengelilingi Matahari, tetapi berotasi sangat lambat. Satu hari di Merkurius sama dengan 30 hari di Bumi.
Venus	Venus melakukan rotasi dengan arah yang berlawanan dengan arah rotasi planet-planet lainnya. Venus berotasi serah jarum jam.

Figure 10. Display questions by filling in the table on the electronic learner worksheet

Pilihlah jawaban yang paling sesuai untuk setiap pertanyaan di bawah! Klik pada jawaban yang benar!

Planet yang terletak paling dekat dengan matahari yaitu...

- a bumi b mars c merkurius d venus

Planet yang terletak paling jauh dari matahari yaitu...

- a saturnus b neptunus c uranus d jupiter

Planet yang memiliki ukuran paling besar dalam tata surya yaitu...

- a venus b bumi c mars d jupiter

Figure 11. Display of multiple choice questions on electronic learner worksheets

Pasangkan gambar planet berikut dengan nama planet yang benar!

Figure 12. Display of matching questions on electronic learner worksheets

Membuat Model Tata Surya

Cobalah untuk merancang model sederhana dari sistem tata surya kita! Gambarkan rancangan model tata surya yang akan kamu buat!

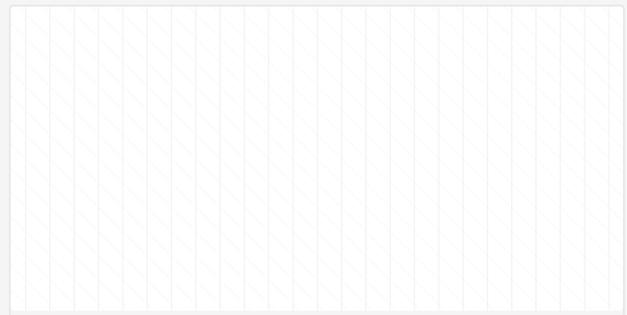


Figure 13. Display of drawing questions on electronic learner worksheets

After the electronic learner worksheet was developed, it underwent validation by material and media experts. The material expert validation was conducted by a lecturer familiar with the science content, using an assessment instrument. The total score from the material expert validator was 37 out of a

maximum of 45 points, resulting in a percentage of 82%. This percentage falls within the very high classification, indicating that the electronic student worksheet is highly suitable for field testing with only minor revisions. The results of the material expert validation are presented in Table 2.

Table 2. Results of material expert validation

Aspect	Indicator	Score
Appropriateness of material content	3	12
Coverage of material	3	12
Presentation of material	3	13
Total Score	9	37
Maximum Score		45
Percentage %		82

The media expert validation was performed by the same lecturer involved in the material expert validation, also utilizing an assessment instrument. The total score from the media expert validator was 55 out of a possible 70 points, yielding a percentage of 79%. This score is classified as high, suggesting that the electronic student worksheet is appropriate for field testing, again with minor revisions. The results of the media expert validation are shown in Table 3.

Table 3. Results of media expert validation

Aspect	Indicator	Score
Media appearance	7	28
Operation	4	15
Media presentation	3	12
Total Score	14	55
Maximum Score		70
Percentage %		79

After validation by material and media experts, then individual trials were conducted at one of the elementary schools in Malang city involving 1 6th grade student. The main objective was to test the feasibility of the research instrument and get feedback from participants regarding the understanding and ease of use of the electronic learner worksheet. Individual trials tend to focus more on technical and practical aspects, such as clarity of questions, sequence, and layout of components on each display. One-by-one trials were conducted using an assessment instrument.

The assessment results from individual trials resulted in a total of 17 points out of a maximum of 20 points. After the percentage was obtained, the result was 85% referring to the assessment category criteria. The 85% percentage is in a very high qualification so it is suitable for use with minor revisions. The results of the trial assessment can be seen in Table 4.

Table 4. Results of one by one trial

Aspect	Indicator	Score
Learning media	2	8
Material	1	4
Evaluation	1	5
Total Score	4	17
Maximum score		20
Percentage %		85%

The mini group trial was done in a Malang City elementary school with three sixth graders. One of the students had a high level of academic achievement, another has a moderate level of achievement, while the last one has a low level of achievement. The student's performance was evaluated by the grades given to them on their report cards. The small group trials were conducted in order to evaluate the effectiveness of the intervention in an environment that is as close to real life as possible. The results of the small group trial were shown in Tables 5 - 8.

Table 5. Results of small group trial I

Aspect	Indicator	Score
Media	7	30
Material	1	4
Critical thinking	1	4
Total score	9	38
Maximum score		45
Percentage %		84

Table 6. Results of small group trial II

Aspect	Indicator	Score
Media	7	30
Material	1	4
Critical thinking	1	5
Total score	9	39
Maximum score		46
Percentage %		86

Table 7. Results of small group trial III

Aspect	Indicator	Score
Media	7	30
Material	1	5
Critical thinking	1	5
Total score	9	40
Maximum score		45
Percentage %		88

Table 8. Results of small group trial IV

Aspect	Indicator	Score
Media	7	86
Material	1	87
Critical thinking	1	93
total	9	
Average percentage %		88.6

After obtaining validation results from both material and media experts, as well as individual and small group trials, a revision of the final product was conducted. This revision was informed by the feedback and suggestions from the validators. During the validation of the learning materials, the validator noted that the content was integrated from multiple subjects; however, this integration was not reflected in the Learner Worksheet. In response to this feedback, the researcher revised the teaching module to focus solely on one subject, specifically science and the topic of Outer Space Objects.

Researchers also revised the learning steps by adjusting the syntax of the applied learning model. During media validation, the validator wrote several notes including: if possible, a cover of the learner worksheet is made by containing the identity of the maker, institution, title of the learner worksheet, theme, and class; the listen to instructions command is changed in Indonesian; Check Back QR code cannot display video; the image is given a description, for example the numbering or the image describes a particular object; the task of classifying the inner and outer planets cannot be filled in; and multiple choice tasks/tasks have not been accompanied by work instructions, while other tasks

already have work instructions. Based on these notes, the researcher revised the product according to the validator's direction.

In addition, the results of individual trials and small group trials can be used as a reference in improving the product. Based on individual trials and small group trials, no significant problems or obstacles were found in using electronic student worksheets. After conducting the trial, the researcher got notes/suggestions, namely the order of the instructions was quite understandable, but there was one clue that was still confusing, namely how to classify the outer planets and inner planets, a tutorial/how to do that part should be made. based on these notes, the researcher revised the product by adding instructions for filling out the electronic student worksheet in the form of a video tutorial. After the product was revised, it continued to the implementation stage in the classroom.

The implementation stage, namely the use of electronic student worksheets in the learning process in class. Students were given test questions before and after the implementation of electronic learner worksheets. Students' pretest and posttest scores obtained an increase which can be seen in Table 9.

Table 8. Students' Pretest and Posttest Scores

Interval Score	Criteria	Number of Students		Percentae %	
		Pretest	Post test	Pretest	Posttest
86-100	Very High	4	10	14.84	37.03
76-85	High	2	8	7.40	29.62
61-75	Moderate	10	4	37.03	14.84
55-60	Low	6	5	22.22	18.51
0-54	Very Low	5	-	18.51	-
Total		27	27	100	100
Completed		16	22	59.27	81.46
Not Completed		11	5	40.73	18.51

Based on Table 9, its can be seen that 16 students fulfilled the completeness criteria which translates to 59.27% and 11 students didn't meet the criteria accounting for 40.37%. The post-Test results demonstrate that 22 students achieved the completeness criteria, which aligns with 81.46% while 5 students did not achieve this making 18.51%. hence, the difference in the criteria menters is, therefore, 22.19%, which reinforces the assumption that the Wizer-based electronic worksheet improved the critical thinking skills of sixth-grade elementary school students to a significant level.

In the evaluation phase, gathering feedback from students along with measuring the achievement of learning objectives was prioritized. The validation outcomes suggest that the electronic worksheet developed evaluatively is proper, scoring on average 88

out of 100 as highly appropriate. Students reported that they were excited and that the fun elements, as well as the illustrated quizzes and explanatory videos of the electronic worksheets, made the lessons easier to grasp.

The improvement of students' critical thinking skills was analyzed using a critical thinking rubric that includes indicators: interpretation, analysis, evaluation, and inference. The pretest and posttest results showed a significant increase with an average score increase of 22.19%.

Discussion

This research seeks to create and develop Learner Worksheets in Science for grade six elementary learners using Wizer.me. It aims to create science content, more engaging and interactive for learners. The ADDIE model was selected for this approach, incorporating analysis,

design, development, implementation, and evaluation phases, creating a structured method for Learner Worksheets that provides interactive and engaging learning experiences.

Based on the analysis stage, field observations and interviews resulted in the real needs of teachers and students for learning media that are interactive, innovative, and in accordance with the Merdeka Curriculum. This is important considering the demands of digital literacy and critical thinking skills which are the main focus in 21st century learning. To develop media or learning tools must be adjusted to the demands of the times, which in the current era has entered 21st century education where learning is directed towards digital learning (Dilekçi & Karatay, 2023; Martínez-Bravo et al., 2022).

In the design and development stage, the electronic learner worksheets were designed using the Wizer.me platform that provides multimedia content such as interactive quizzes, explanatory videos, and tasks that support active student engagement. Validation by media and material experts showed that this product was very feasible to use with an average validation score of 88 out of 100 and received constructive suggestions that were adopted for revision. This indicates that the electronic learner worksheet can meet the quality standards of effective digital learning media. In developing media or learning tools, the validity level must first be tested with media, material, and even language experts so that the media developed can have proven quality and can be used to the maximum for users (Kaliappen et al., 2021; Maharani & Hidayah, 2024; Osipova & Bagrova, 2023).

Product trials in the classroom showed positive responses from students who found it easier to understand the material and were more enthusiastic about participating in learning activities thanks to the interactive features on the learners' worksheets (such as illustrated quizzes and explanatory videos). In addition, the results of the pretest and post-test analysis indicated a significant increase in critical thinking skills, with a difference in score increase of 22.19%. This improvement was observed through the critical thinking rubric which includes indicators of interpretation, analysis, evaluation, and inference.

The successful use of Wizer.me-based learner worksheets not only improves students' critical thinking skills but also strengthens their digital literacy in accordance with the needs of the times and global competition and supports the achievement of the Sustainable Development Goals (SDGs), especially in the aspect of quality education (Alm et al., 2022; Lin et al., 2017; Saini et al., 2023). This research also provides important notes related to technical obstacles

encountered during validation, such as the replacement of instruction text in Indonesian, and improvements to several features such as instructions for working on planetary grouping tasks. This shows that in the development of digital media, content customization and ease of access greatly affect the effectiveness of use (Alakrash & Abdul Razak, 2021; Tay et al., 2022).

Consequently, the Wizer.me-based learner worksheets have been demonstrated to be effective as an innovative and easily implementable interactive learning tool at the elementary school level, aimed at enhancing the quality of science education and fostering students' critical thinking skills. Moving forward, it is suggested that the development of electronic learner worksheets be expanded to encompass other subjects, along with conducting long-term evaluations to ensure the sustainability and effectiveness of the learning materials. The improvements observed in post-test results indicate that the developed media or learning tools are effective in enhancing learning outcomes (Mayasari et al., 2023).

The development of Wizer.me-based learner worksheets provides a digital learning solution that improves the quality of science learning outcomes and critical thinking skills of grade VI elementary school students (Holm, 2025; Kaliappen et al., 2021; Kim et al., 2020). With assistance and revisions based on validation, this media is able to present a learning experience that is interactive, interesting, and in accordance with today's digital literacy needs. This research confirms the importance of educational innovations that utilize technology optimally in facing the challenges of 21st century learning.

Conclusion

Electronic worksheet based on the Wizer.me application has proven effective in improving the quality of science learning and critical thinking skills of grade VI elementary school students, especially on the material of outer space objects. The effectiveness of this media can be seen from the significant increase in post-test results compared to pretest, with an average increase in critical thinking skills scores of 22.19%. In addition, the electronic learner worksheet received a very decent rating based on the validation of material and media experts as well as positive responses from students and teachers who felt that learning became more interesting, interactive, and easy to understand through features such as illustrated quizzes and explanatory videos embedded in the media. This media is also considered as an alternative interactive learning solution that is relevant to the demands of digital literacy and 21st century learning at the primary school

level. This study recommends the development of electronic learner worksheets for other subjects as well as testing the use of media over a longer period to optimize its benefits in learning.

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Author Contributions

Numerous individuals contributed to the completion of this research. The principal author was responsible for presenting the topic, foundational concepts, and essential materials, while the co-authors focused on designing and structuring the research methodologies. All authors collaboratively undertook responsibilities for data collection, data organization and analysis, the peer review process, and manuscript preparation.

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Conflicts of Interest

The author declares that he has no conflict of interest.

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