

Development of E-Student Worksheet Based Task-Based Learning Through LiveWorksheets.com for High School Students

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Development of E-Student Worksheet Based Task-Based Learning Through LiveWorksheets.com for High School Students

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ABSTRACT

This study aims to determine the development of an electronic student worksheet using the LiveWorksheets interactive website that is reliable, useful, and efficient on the material produced. This kind of research and development (R&D) tries to create an e-student worksheet product. Liveworksheet task-based learning development is accomplished using the ADDIE design development, which includes analysis, design, development, implementation, and evaluation. Students in Class 11-TKJ at SMK Perbankan Riau in 2023 served as the study's test subjects. A validation sheet was used to assess the reliability of the e-student worksheet, a response questionnaire was used to determine how useful the e-student worksheet was, and learning outcomes tests were used to determine the efficiency of the e-student worksheet. The results of material expert validation and learning expert validation amounted to 91.8% with very good criteria and 82.6% with very good criteria. Comparison of results before and after using the e-student worksheet is pre-test 76.8 and post-test 85.88. Therefore, it is known that there is an increase in student understanding by using e-student worksheets through LiveWorksheets. The questionnaire response of students received an average rating of 78.2% with good criteria. While the teacher's questionnaire response obtained a score of 80% with good criteria. Thus, it can be concluded that interactive e-student worksheets through LiveWorksheets is reliable, usable, and efficient also can increase student learning motivation.

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1. INTRODUCTION

A new generation of digital natives was created with the introduction of new information technologies in Industrial Revolution 4.0 (Hurrahma and Sylvia, 2022). Before the rise of Industry 4.0, the initial revolution utilized water and steam for production, followed by the second revolution which employed electric power for mass manufacturing. The third revolution integrated electric power and information technology to develop automation. Industry 4.0 signifies the fusion of cyber-physical systems, the Internet of Things (IoT), and a system that will generate new employment opportunities that may not align with existing career paths (Darmuki et al., 2023).

The impact of industry 4.0 or the fourth generation of industry will have an impact on all sectors including the world of education (Yunos & Din, 2019). Mastery of computers and gadgets has become a must for educators in this era. The use of paper has begun to decrease, distance is no longer an obstacle, meetings no longer must be at the desk, and learning activities are not only done by meeting in class or school. This is supported by statement from Nurafriani and Mulyawati (2023) technology as knowledge, TPACK (Technological Pedagogic Content Knowledge) is learning that combines system technology education and learning applications. Application learning in the form of learning videos, PPT (Power Point), LKPD (*Lembar Kerja Peserta Didik*), and modules carried out in a guided and expected manner improves students' learning skills.

Based on Andresen & Brink (2013) the overall goal of using multimedia in education is to build meaningful and understandable knowledge, build knowledge that is applicable, and improve understanding about learning. These critical competencies help participants become experts in the learning process (Prabowo, 2021). A personal computer (PC) or laptop connected to an internet network connection is used to implement the learning system. Teachers can use groups on common social media platforms like WhatsApp (WA), Classroom, Zoom, Google Meet, Edmodo, quizziz, LiveWorksheets, or other media to learn together at the same time (Kharismawati & Kaltsum, 2022).

Student Worksheet (*Lembar Kerja Peserta Didik*) is a type of learning material that is commonly used in schools (Cholifah & Novita, 2022). Student worksheet is a learning support service that consists of brief material exposures and practice questions designed to teach students how to locate and develop process skills, as well as how to solve difficulties and accelerate the learning process (Hazlita, 2021; Amaliyah et al., 2022). According to Farkhati (2019). E-Student Worksheet (*Elektronik Lembar Kerja Peserta Didik*) is an electronic student worksheet that can be accessed from a laptop or smartphone at any time and from any location, teacher may utilize e-student worksheet as a learning tool to encourage student participation (Prastika & Masniladevi, 2021). The usage of e-student worksheet in the classroom makes learning more enjoyable for students, makes learning more engaging, and allows students to practice what they have learned (Sihombing et al., 2022).

E-student worksheet refers to a digital or electronic version of traditional paper worksheets that are used for educational purposes. E-student worksheets are typically designed to be interactive and may include multimedia elements such as images, videos, and hyperlinks. These worksheets can be accessed and completed on electronic devices such as computers, tablets, or smartphones, allowing students to engage with the material in a digital format (Nirmayani, 2022). In designing e-student worksheet, it can be created with a note that it must be in accordance with the learning objectives and creativity of each subject teacher (Masrurroh et al., 2023). A LiveWorksheets is one tool that can be utilized to generate an e-student worksheet. LiveWorksheets is a web-based platform that can be found at <https://www.LiveWorksheets.com> (Farman et al., 2021).

The utilization of e-student worksheet with LiveWorksheet for the high school level contributes significantly to enhancing the learning experience (Hurrahma & Sylvia, 2022). Incorporating e-student worksheet into lessons provides students with interactive and engaging activities that cater to various learning styles. LiveWorksheet, as a platform for creating and sharing interactive worksheets, further enriches the learning process by allowing teachers to integrate multimedia elements such as videos, audio clips, and interactive exercises (Tressyalina et al., 2023). This approach fosters a more dynamic and immersive learning environment, enabling students to actively participate in their learning. Furthermore, the e-student worksheet with LiveWorksheet promotes self-paced learning, as students can access the materials at their convenience and revisit them as needed. This flexibility not only accommodates different learning paces but also encourages students to take ownership of their learning journey (Humaira et al., 2022).

Moreover, e-student worksheet with LiveWorksheet facilitates teachers in monitoring student progress and understanding through immediate feedback features (Andriyani et al., 2020). Teachers can track students' responses in real-time, identify areas of difficulty, and provide timely intervention and support. This real-time feedback loop promotes a more personalized learning experience, ensuring

that students receive the necessary guidance to master the concepts effectively. In conclusion, the integration of e-student worksheets with LiveWorksheet for high school education offers a range of benefits that enhance the overall learning experience. By providing interactive, multimedia-rich content, promoting self-paced learning, and facilitating real-time feedback, this approach contributes significantly to creating a more engaging, effective, and personalized learning environment for students.

According to observations made at SMK Perbankan Riau, the learning process and distance learning are still using media that was commonly used at the start of the pandemic, where the teacher explains the material using the Zoom Meeting or Google Meet application, but this is not done every day. Following that, the teacher distributes Student Worksheets (LKPD) to students via Google Classroom or WhatsApp. Then, using the Google Classroom or WhatsApp application, students do it in Microsoft Word or on paper then submit it back to the teacher. Based on the observations, it is possible that it will cause a sense of saturation over time (Izzah & Auliya, 2023).

Sometimes there are teachers who forget to give direct grades to students. There are also teachers who are indolent in checking student assignments because they must check one by one through a laptop/smartphone (Fepiana & Salamah, 2022). So that students do not know what is done and what has been collected is right or wrong. By using a live worksheet as an assignment, the student's grades will come out according to the system that the teacher has created (Fuada & Fajriati, 2021).

The research purpose of developing e-student worksheets using LiveWorksheets is to enhance the effectiveness of teaching materials and improve student learning outcomes in various subjects. By utilizing interactive and engaging features, e-student worksheets can help students better understand and retain the material, leading to improved academic performance. Additionally, e-student worksheet can address challenges such as limited access to traditional learning resources, especially in remote or underprivileged areas, by providing an alternative platform for learning. Overall, the development of e-student worksheets using LiveWorksheets has the potential to revolutionize the way students learn, making education more accessible, engaging, and effective.

2. METHODS

This researcher uses the Research and Development (R&D) method. R&D is a systematic approach that emphasizes the creation of practical and effective teaching materials through iterative development and evaluation. According to Sugiono (2015:407) the research and development method is a research method used to produce certain products, and test the effectiveness of these products. This research will produce learning tools in the form of learning media, which will be tested for validity and practicality. The steps in developing e-student worksheet were used by ADDIE model. The ADDIE model is a systematic instructional design framework used to guide the development of effective teaching and learning materials. It consists of five main stages: Analysis, Design, Development, Implementation, and Evaluation. The research was conducted in the even semester of the 2023/2024 academic year. The test subject in this research and development trial was conducted on a small group grade 11-TKJ with 25 students at SMK Perbankan Riau.

The first step, analysis, was carried out by observing and interviewing teachers and served as the foundation for the development of student worksheets. After knowing the results of the analysis, the second step is design. There was a need for creativity in the design of interactive teaching materials, such as LiveWorksheets-based interactive student worksheets, so that the subject matter might come to life and stimulate student inventiveness and creativity (Khikmiyah, 2020). The cover, basic competencies (KD), learning indicators, learning objectives, material summaries packaged in PowerPoint form, learning videos, discussion questions, and various practices (Nianti et al., 2022).

The third stage is development, in which the researchers took the student worksheet design from the previous stage and developed it into an interactive student worksheet based on LiveWorksheets. The validator also validated this step to analyze the practicality of the student worksheet and make relevant comments for improving the student worksheet (Susilawati et al., 2023). The finished product

then produces a product that will be tested for validation. The expert test was carried out by one material expert (lecturer) and one learning expert (teacher). Validation is carried out to obtain information regarding the feasibility of the material and the feasibility of the product teaching materials being developed, as well as to obtain comments and suggestions that can be used as a basis for carrying out revision.

After the product has been validated by the validator, the implementation is carried out in class 11-TKJ with 25 students at SMK Perbankan Riau. The purpose of this study was to test the viability of the e-student worksheet by employing a LiveWorksheets on semester 2 in English subject. The implementation stage of the e-student worksheet is carried out in classroom learning after acquiring a valid e-student worksheet (Susanti et al., 2023). This media was used in the meeting with the Personal Letter sub-topic. The e-student worksheet link was distributed to students via WhatsApp. Then directed students to open the liveworksheets link and instructed them how to do the exercise. A paper test was conducted before using liveworksheets to determine students' knowledge, then using e-student worksheets through liveworksheets to determine the improvement of students' scores and responses.

The final step in the process is evaluation. To evaluate the effectiveness of the e-student worksheet with LiveWorksheet in enhancing student learning outcomes, the researcher likely employed various metrics and methodologies. Pre-test and post-tests may have been used to measure improvements in knowledge and understanding, while learning achievement could have been assessed through students' grades on related assignments and exams. Retention rates might have been considered to gauge the ability of the e-student worksheet to maintain student engagement and motivation. Additionally, data on student engagement, such as participation rates in online activities, could have been collected. Feedback surveys might also have been utilized to gather students' opinions on the usability, effectiveness, and overall impact of the e-student worksheet on their learning. These metrics and methods, when analyzed using statistical techniques, would provide valuable insights into the efficacy of the e-student worksheet in improving student learning outcomes and could guide future enhancements to the teaching materials.

3. FINDINGS AND DISCUSSION

Validity, practicality, and effectiveness are the three primary facets that are considered in the construction of this e-student worksheet. Analyzing, designing, developing, implementing, and evaluating were the phases of the ADDIE development model.

3.1. Findings

3.1.1 Analysis

Based on the research that has been conducted, the results of the first stage, namely the analysis. This stage's findings indicated problems with teaching resources, which were largely textbooks and could only be used during English class hours. Outside of class, students did not have access to handbooks. Furthermore, although it was still presented on sheets of paper, student worksheets were used as teaching instruments. This student worksheet covered student identity, description material, and practice questions. Previously, student worksheets like this lacked content, a professional appearance, and practicality, causing students to feel bored and lose interest in learning (Hidayah & Asari, 2022). As a result, students depended only on teacher explanations during the learning process, resulting in a lack of student participation. Traditional student worksheet was also less useful because it required the teacher to print the student worksheet on sheets of paper (Humaira et al., 2022).

3.1.2 Design

In the second stage, which is the design phase, the author focuses on creating engaging e-student worksheet learning materials for English using LiveWorksheet. To enhance creativity and provide a variety of design options, the author utilizes CANVA for developing and editing the materials. Each material is carefully crafted to include a visually appealing cover, clear instructions using LiveWorksheet features, detailed basic competencies and indicators, comprehensive material elaboration, and a variety of exercises. The design of the materials is aimed at captivating students' interest and making the learning experience enjoyable and effective. The following is e-student worksheet using LiveWorksheets:

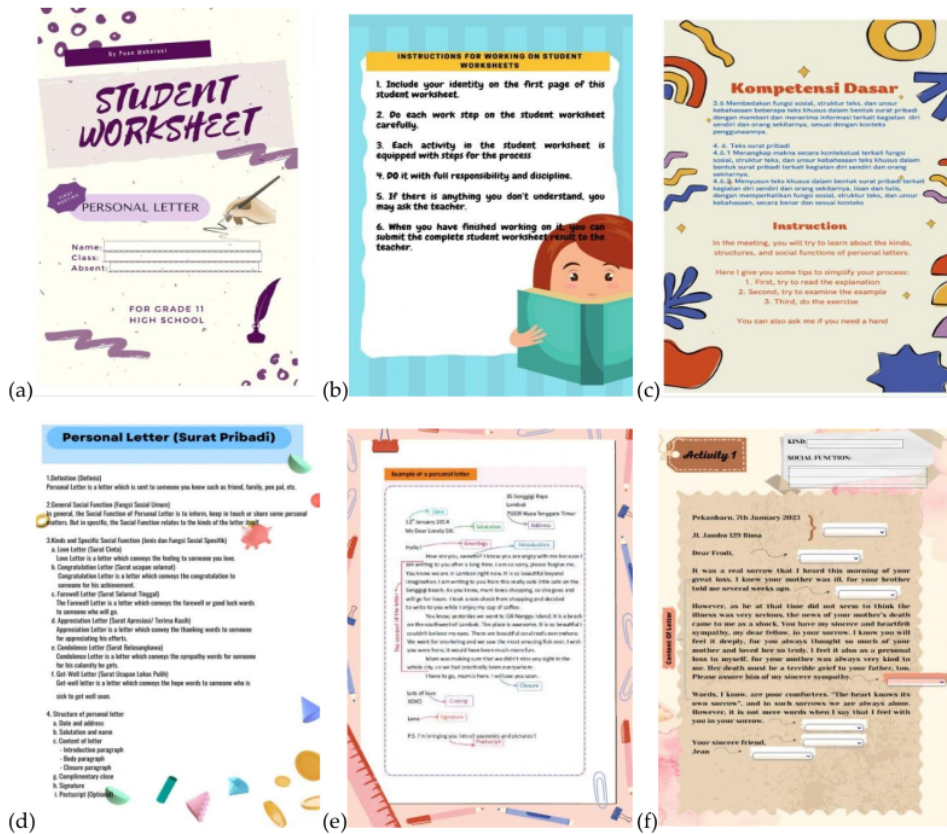




Figure 1. LiveWorksheets-based interaktif LKPD. (a). cover of e-student worksheet, (b). intructions, (c). basic competence, (d) material 1, (e). material 2, (f). Assignment1, (g). assignment2.

In answering the exercise questions, students are presented with a range of options designed to accommodate different learning styles and abilities. These options include checkboxes, where students can select multiple correct answers from a list of choices, enabling quick assessment of knowledge or recognition-based questions. Short essays require students to provide brief written responses, encouraging critical thinking and a deeper understanding of the material. Join with arrows tasks prompt students to match items by drawing lines or arrows between related items, fostering visual learning and concept association. The drag-and-drop format require students to physically move objects or labels to match corresponding items, reinforcing spatial reasoning and concept organization. Drop-down select box questions provide a more structured format for selecting responses, encouraging careful consideration of choices. Finally, tasks involving speaking and listening require students to respond verbally or listen to audio prompts, enhancing language skills and comprehension through auditory learning. These varied question formats not only make the exercises more engaging but also cater to diverse learning preferences, ensuring that students can demonstrate their understanding effectively.

3.1.3 Development

In the development phase, validation tests were conducted by material expert and learning expert, which included English Lecturer from the Universitas Islam Riau for material expert and learning expert is an English Teacher from SMK Perbankan Riau. The expert validity questionnaire test on the learning media can be conducted (Arifin & Nurdyansyah, 2018). The equation is as follows:

$$P = \frac{\sum R}{N} \times 100\%$$

Description:

P = Percentage of score sought (results are rounded up to an integer)

$\sum R$ = Number of answers given by the selected validator/choice

N = Total maximum or ideal score

According to Arikunto (2010) to determine the percentage can use the following formula:

Table 1. Achievement level and Qualification

No	Achievement level (%)	Qualification	Description
1.	81 - 100%	Very good	Very worthy, no need to revise
2.	61 - 80%	Good	Worthy, no need to revise
3.	41 - 60%	Enough	Unworthy, need to revise
4.	21 - 40%	Less	Unworthy, need to revise
5.	<20%	Very lacking	Very unworthy, need to revise

Percentage of Expert Validation Questionnaire

1. Material Expert

Table 2. Material Expert Validation Result

Aspect	Aspect Scores	Max Score	Percent	Description
Teaching Material Learning	7	8	87,5%	Very Good
Curriculum	11	12	91,6%	Very Good
Material Content	15	16	93,7%	Very Good
Total	33	36	91,6%	Very Good

Based on table 2 above, it shows the results of material expert validation of 91.6% with very good criteria and no need to revise, that the development of an e-student worksheet based on LiveWorksheets is very feasible to be developed in the learning process.

2. Learning Expert

Table 3. Learning Expert Validation Results

Aspect	Aspect Scores	Max Score	Percent	Description
Media appearance criteria	10	12	83,3%	Very Good
Presentation of material on the media	6	8	75%	Good
Interest in learning media	13	16	81,2%	Very Good
Student involvement using media	10	12	83,3%	Very Good
Feedback	4	4	100%	Very Good
TOTAL	43	52	82,6%	Very Good

Based on the table 3 above, the learning expert validation results show 82.6% with very good criteria and no need to revise, that the development of e-student worksheet based on LiveWorksheets is very feasible to be developed in the learning process.

3.1.4 Implementation

The implementation of e-student worksheets with LiveWorksheets involves several key steps to ensure its effectiveness in enhancing student learning. The researchers were given 45 minutes or one class period for the implementation. The session began with a 5-minute explanation of the material on personal letters. Following this, students spent 20 minutes completing a five-question objective test. The remaining 20 minutes were dedicated to using LiveWorksheet for interactive exercises, specifically utilizing the drop-down option.

Before and After Using the e-student worksheet

The tests were conducted using pre-test and post-test with Personal Letter material in grade 11 with 25 students. The students expressed that they had never used the LiveWorksheet website for either teaching materials or exercises. The teachers still relied on a manual system, using questions from textbooks or printed materials, with only multiple-choice or essay-type answers available. This traditional method has been used up to now, affecting student grades. However, after a trial using

LiveWorksheet in the 11th grade TKJ class, the average student grades increased significantly. This improvement demonstrates the effectiveness of e-student worksheet with LiveWorksheet in aiding student learning and understanding of the material. The test results are presented below:

Learning Outcomes of Pre-test and Post-test

Table 4. Outcomes of Pre-test and Post-test

Score	Pre-test	Post-test
Highest	100	100
Low	40	52,9
Mean	76,8	85,88

Based on the table 4 above shows the results before and after using the LiveWorksheets-based LKPD, the average value of students is 76.8 and 85.88. Based on the results of this study, it can be concluded that the using a e-student worksheet through LiveWorksheets is very feasible to be developed in the learning process. By implementing e-student worksheet with LiveWorksheet effectively, hopefully teachers can create a more engaging and interactive learning environment that enhances students' learning experiences.

3.1.5 Evaluation

The final step in the process is evaluation, which plays a critical role in determining the effectiveness of e-student worksheets with LiveWorksheet in improving student learning outcomes. Evaluation involves several essential aspects. Firstly, it requires assessing whether the learning objectives set at the beginning of the lesson or module have been met. Secondly, feedback from students is crucial. Gathering their opinions on the usability and effectiveness of the e-student worksheet and LiveWorksheet provides valuable insights for improvement.

While the feasibility of LiveWorksheets-based e-student worksheet is obtained from student response questionnaires and English subject teacher questionnaires in grade 11-TKJ at SMK Perbankan Riau.

Percentage Questionnaire Students' Response

Table 5. Student Questionnaire Results

Aspect	Aspect Scores	Max Score	Percent	Description
The Use of Teaching Materials	165	200	82,5%	Very Good
User Reactions	159	200	79,5%	Good
Support Facilities	67	100	67%	Good
TOTAL	391	500	78,2%	Good

Based on the table 5 above, it shows the results of student questionnaire responses of 78.2% with good criteria and no need to revise, that the development of e-student worksheet based on LiveWorksheets is very feasible to be developed in the learning process. The questionnaire includes five questions regarding students' perceptions of using the LiveWorksheet. Fifteen students agreed and ten students strongly agreed that working on e-student worksheet using the LiveWorksheet was easy to understand. The instructions provided were described as clear and easy to understand, with 16 students agreeing, 7 students strongly agreeing, and 2 students disagreeing. The appearance of the e-student worksheet was deemed attractive and interactive, supported by statements from 15 students agreeing, 7 students strongly agreeing, and 3 students disagreeing. Overall, students showed interest in LiveWorksheet-based e-student worksheet, and their scores indicated greater improvement when using the LiveWorksheet, with an average satisfaction rating of 78.2%.

In addition to the quantitative data, qualitative feedback from students and teachers can provide a more comprehensive understanding of their experiences with the e-student worksheet using LiveWorksheet. For example, students may have expressed that they enjoyed the interactive elements of the e-student worksheet, finding them engaging and helpful in understanding the material. Teachers may have noted that the e-student worksheet made it easier for them to track students' progress and tailor their teaching to meet individual learning needs. Including such testimonials can add depth to the evaluation, highlighting not just the numerical outcomes but also the practical benefits and challenges faced by stakeholders in using the e-student worksheet.

Percentage Questionnaire Teacher' Response

Table 6. Teacher Response Questionnaire Results

Aspect	Aspect Scores	Max Score	Percent	Description
The Use of Teaching Material	6	8	75%	Good
User's Reaction	3	4	75%	Good
Support Facilities	7	8	87,5%	Very Good
Total	16	20	80%	Good

Based on the findings presented in Table 7, which indicate an 80% satisfaction rate among teachers with good criteria and no need for revision, it is evident that the development of e-student worksheet using LiveWorksheets is highly feasible for integration into the learning process. Teachers have expressed positive opinions regarding the usability and effectiveness of LiveWorksheets, highlighting their potential to enhance student engagement and learning outcomes.

In conclusion, the evaluation results from both students and teachers indicate a highly positive response. Specifically, 78.2% of students and 80% of teachers expressed satisfaction with the e-student worksheet developed using LiveWorksheets. These findings strongly endorse the effectiveness and usefulness of LiveWorksheets in enhancing the teaching and learning process, highlighting their potential to improve student engagement and learning outcomes.

These findings strongly support the effectiveness and utility of LiveWorksheets in enriching the teaching and learning process, underscoring their ability to enhance student engagement and improve learning outcomes. Educators and curriculum developers are encouraged to explore the integration of LiveWorksheets into their teaching practices, as this approach has the potential to significantly enhance student learning experiences and outcomes.

3.2. Discussion

The integration of technology in education has transformed the way students learn and teachers teach. One such technological innovation is the use of LiveWorksheets, which are digital worksheets that offer interactive and engaging features to enhance the learning experience. This discussion explores the development and effectiveness of e-student worksheet (electronic Student Worksheets) using LiveWorksheets in various educational settings. Three studies are reviewed to highlight the impact of LiveWorksheets on student learning outcomes and the overall teaching process.

The advantages of using LiveWorksheets, as highlighted by Supriatna et al. (2022) offer significant benefits for both students and teachers. Firstly, the process of developing more effective worksheet teaching materials can enhance students' skills in actively practicing speaking skills, promoting interactive and communicative learning. Secondly, the study showed that students responded positively to actively participating in assessing and reviewing the quality of the worksheets, indicating an enthusiastic engagement with the material. Thirdly, LiveWorksheets enable students to be more active in their learning, moving beyond passive reception of information to actively responding to material, questions, and exams with various engaging methods. Lastly, the flexibility of LiveWorksheets allows for access anytime and anywhere, ensuring

that all students can access materials and questions, thus reducing the risk of students being left behind (Lioba et al., 2021).

However, the disadvantages of LiveWorksheets should also be considered. Firstly, LiveWorksheets require software to open, such as a computer or other device, which can be time-consuming compared to traditional books that can be easily opened and closed. Secondly, some individuals may find reading on a monitor uncomfortable, leading them to print the LiveWorksheets, which may negate some of the benefits of digital materials. Lastly, the small display of letters on a monitor can lead to eye strain and fatigue, especially with prolonged use.

These advantages and disadvantages impact the overall effectiveness and feasibility of using LiveWorksheets in educational settings. The advantages, such as increased student engagement and accessibility, suggest that LiveWorksheets can enhance learning outcomes. However, the disadvantages, such as the need for specific software and potential eye strain, may limit their effectiveness in certain contexts. Educators should consider these factors when deciding whether to use LiveWorksheets and explore strategies to mitigate any potential drawbacks, such as providing alternative formats for students who prefer not to use digital materials.

As for the results of research that are relevant to this research, namely research that has been conducted by Widiyanti (2021) in her thesis research with the title "*Pengembangan bahan ajar e-student worksheet menggunakan liveworksheet pada materi bangun datar kelas IV sekolah dasar*". This study aims to 1) describe developing e-student worksheet materials, 2) determine the feasibility of applying e-student worksheet liveworksheet teaching materials for grade IV elementary school students using mathematics learning that focuses on grade IV elementary school flat building material. this research and development use the ADDIE development model. How to use e-student worksheet teaching materials, namely with covid 19 pandemic conditions using zoom meetings with instructions for using students to observe learning videos on e-student worksheet and work on evaluation questions on e-student worksheet. The results showed that the research and development of e-student worksheet liveworksheet teaching materials was feasible to use in learning. the validation results showed the level of validity reached 90% with a very valid statement, the material expert 80% was very valid, the teacher's response was 95% very valid and the student's response was 83%. So, this research is said to be feasible to use as teaching material.

The second study, conducted by Widiyani & Pramudiani (2021), with the title "*Pengembangan Lembar kerja peserta didik (LKPD) Berbasis Software Liveworksheet pada Materi PPKn*". The aim was to create teaching materials that support students' learning outcomes and assess their feasibility and students' responses to these worksheets. The research followed the Research and Development (R&D) approach with the ADDIE development model. During the validation stage, the LKPD was assessed by two validators, one specializing in the material and the other in media. Subsequently, the LKPD based on LiveWorksheet software was tested on fifth-grade students at SDN Kebon Kosong 07 Pagi in the second semester of 2020-2021. Results showed that the LKPD based on LiveWorksheet software was considered feasible, with media experts achieving 75% and material experts achieving 91.75% in their evaluations. The student trial resulted in a 73.52% achievement with a good rating. In conclusion, the study found that the LiveWorksheet software-based LKPD for Civics material, specifically on the subtheme of "Rights," is both feasible and engaging as a learning evaluation tool for fifth-grade students.

The third study, conducted by Susilawati et al., (2023) focused on "Development of liveworksheet-based interactive LKPD on the biodiversity material of class X". The research aimed to create a valid, practical, and effective Liveworksheet-based interactive LKPD using the ADDIE development model. The study employed validation questionnaires, response questionnaires, learning outcomes tests, and observation sheets as instruments, involving 29 students from class X MIA 3. The results revealed a high level of validity for the interactive LKPD based on Liveworksheet, with an average score of 3.6. The practicality level, as indicated by student and teacher responses, was 82.1% and 89.2%, respectively. Moreover, the effectiveness level was rated as very good, with a 100% completeness rate for classical learning outcomes. These findings suggest that the Liveworksheet-based interactive LKPD is both valid and effective, providing an engaging learning experience for students and facilitating mastery of classical content.

In conclusion, these three studies collectively highlight the potential of LiveWorksheets as an effective tool in enhancing the teaching and learning process. The positive validation and feedback from experts, teachers, and students suggest that LiveWorksheets can be a valuable addition to the educational toolkit, particularly in facilitating remote or blended learning environments, such as those imposed by the COVID-19 pandemic. Furthermore, the findings underscore the importance of incorporating interactive and engaging elements into teaching materials, which can enhance student motivation and learning outcomes.

Moving forward, future research could explore further the specific features and designs of LiveWorksheets that contribute most to their effectiveness. Additionally, studies could investigate the implementation of LiveWorksheets in different subjects and educational levels to determine their generalizability and impact across diverse learning contexts. By continuing to explore and refine the use of LiveWorksheets, educators can further enhance their ability to create engaging and effective learning experiences for students.

4. CONCLUSION

Based on the research findings, the developed learning media product is an e-student worksheet in English designed for class XI at SMK Perbankan Riau. Validation results from material and learning experts yielded scores of 91.8% and 82.6%, respectively, both falling under the "very good" criteria with no need for revision. The pre-test and post-test scores, 76.8 and 85.88, respectively, indicate a notable improvement in student understanding when using the e-student worksheet through LiveWorksheets. Additionally, student and teacher questionnaire responses averaged 78.2% and 80%, respectively, both categorized as "good" with no need for revision. These findings suggest that the e-student worksheet based on LiveWorksheets is valid, practical, and effective in enhancing student comprehension of the subject matter. However, the research is limited to a specific educational context and subject area, and future research should explore its applicability across different subjects and educational settings to generalize the findings. Furthermore, investigating long-term impacts on student engagement and learning outcomes would provide a more comprehensive understanding of its efficacy.

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