



Development of Android-Based E-LKPD Assisted by Liveworksheet in Basic Accounting Subjects at SMKN 1 Medan

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Abstrak

Penelitian ini bertujuan untuk mengembangkan e-LKPD berbasis android berbantuan liveworksheet pada mata pelajaran akuntansi dasar di SMKN 1 Medan menggunakan model pengembangan 4D (Define, Design, Develop, Disseminate) dan metode Research & Development (R&D). Penelitian ini juga bertujuan untuk mengetahui kelayakan e-LKPD berdasarkan standar BSNP, menilai praktikalitas melalui respon guru akuntansi dan peserta didik, serta mengukur keefektifan produk melalui hasil post-test. Proses penelitian diawali dengan analisis kebutuhan melalui wawancara dengan guru akuntansi dan penyebaran angket kepada peserta didik. Selanjutnya, dilakukan perancangan draf e-LKPD yang kemudian divalidasi oleh ahli materi dan media. Hasil uji validitas menunjukkan bahwa kelayakan isi memperoleh skor 92,3%, kelayakan penyajian 95%, kelayakan bahasa 96%, dan media 94% dengan kategori sangat valid. Uji praktikalitas menunjukkan respon guru pada aspek ketertarikan dan bahasa sebesar 91,6% serta kelayakan bahasa 83,3%. Sementara itu, respon peserta didik mencakup ketertarikan sebesar 82,6%, materi 80,5% dan bahasa 82,9%, yang semuanya masuk dalam kategori sangat praktis. Uji keefektifan melalui post-test menunjukkan tingkat kelulusan peserta didik mencapai 85,7% dengan kategori sangat baik. Berdasarkan hasil tersebut, e-LKPD berbasis android berbantuan liveworksheet dinyatakan layak, praktis, dan efektif untuk digunakan dalam pembelajaran akuntansi dasar di SMKN 1 Medan.

Kata Kunci: Pengembangan, E-LKPD, Liveworksheet, Akuntansi Dasar.

Abstract

This study aims to develop an android-based e-LKPD assisted by liveworksheet for basic accounting subjects at SMKN 1 Medan using the 4D development model (Define, Design, Develop, Disseminate) and the research & Development (R&D) BSNP standards, assess its practicality thorough responses from accounting teachers and students, and measure the product's effectiveness through post-test results. The research process began with a needs analysis conducted through interviews with accounting teachers and distributing questionnaires to students. Subsequently, a draft of the e-LKPD was designed and validated by material and media experts. The validity test results showed that content feasibility scored 92,3%, presentation feasibility 95%, language feasibility 96%, and media feasibility 94%, all categorized as very valid. The practicality test revealed teacher responses regarding interest and language at 91,6%, with language feasibility at 83,3%. Meanwhile, student responses include interest at 82,6% material at 80,5%, and language at 82,9%, all classified as very practical. The effectiveness test through post-test results showed a student pass rate 85,7%, categorized as very good. Based on these findings, the android-based e-LKPD assisted by liveworksheet is declared feasible, practical, and effective for use in basic accounting learning at SMKN 1 Medan.

Keywords: *Development, E-LKPD, Liveworksheet, Basic Accounting.*

Introduction

Globalization has influenced all aspects of life, from science, technology, social, to culture. This era, also known as the 21st century, is marked by the industrial revolution 4.0, characterized by the rapid development of digital information, allowing people to connect globally. According to (Setiawan, 2021), this revolution supports the implementation of the Merdeka Curriculum, aiming to enhance students in learning through engaging material and assessments. The 21st century differs from previous eras, especially with advancements in technology and communication (ICT). These innovations have greatly impacted education, pushing teacher not only to teach but to be creative and innovative in using technology as a learning tool (Rahayuningsih & Muhtar, 2022). One crucial learning material is the student worksheet (LKPD), which helps teachers deliver content systematically and encourages active student participation. With the rise of technology, conventional paper-based LKPD have evolved into electronic LKPD, enriched with audio, images, and videos to foster interactive learning (Nufus & Sakti, 2021).

Research by (Apriliyani et al., n.d.) highlights that using electronic teaching materials, such as e-LKPD, boosts students critical thinking skill by making lessons more engaging. Another study by Rahmadhani (2024) emphasize that e-LKPD create meaningful and enjoyable learning experiences. Therefore, developing android-based e-LKPD is crucial for providing flexibility and accessibility to students. In accounting education, complex concepts, such as the accounting cycle for service companies, often challenge students understanding (Rahmawan Putra & Adhi Nugroho 2020) Using e-LKPD for accounting worksheets allows teachers to strengthen students comprehension by integrating visual aids and interactive media. A promising tool for this purpose is the liveworksheet platform, which converts traditional worksheets into interactive formats, allowing students to answer various question types multiple choice, short answers, and matching while receiving immediate feedback (Prabowo, 2021).

Liveworksheet benefits both teachers and students by providing a dynamic learning experience, saving time, and reducing paper use (Ghaisani & Setyasto, 2023). Research by Putri & Susilowibowo (2023) confirms that developing HOTS-based e-LKPD using the ADDIE model aligns with the independent curriculum and is deemed highly feasible, with material expert validation at 87,7% language experts at 96%, and graphic experts at 84%. Another study by Sari & Susilowibowo (2022) using the 4D model similarly showed high validation scores, averaging 87,73%.

Despite these advancements, SMKN 1 Medan still primarily uses paper-based LKPD for accounting subjects. These printed worksheet are easy to access but lack the interactivity needed to accommodate various learning styles-visual. Auditory, and reducing time efficiency. A survey of accounting teachers and students at SMKN 1 Medan revealed a strong interest in technology-integrated teaching material and highlighted the limitation of conventional LKPD. Therefore, developing an android-based e-LKPD using liveworksheet offers an innovative solution. This approach incorporate multimedia elements videos, animations, and interactive exercise allowing students to record transactions and create journals digitally. It also provides automatic feedback, enhancing both student engagement and teacher efficiency (A. A. Sari, n.d.)

Based on the above studies, this research aims to develop an android-based e-LKPD using liveworksheet for basic accounting at SMKN 1 Medan. the research objectives are:

- 1.) to develop an android-based e-LKPD for basic accounting at SMKN 1 Medan using the Define, Design, Develop, and Disseminate (4D) model.
- 2.) To determine the feasibility of the developed android-based e-LKPD on service company worksheets, following the national education standards agency (BSNP) criterial:content feasibility, presentation feasibility, and language feasibility.
- 3.) To assess the practicality of the android-based e-LKPD through responses from accounting

teachers and tenth-grade students at SMKN 1 Medan.

4.) To evaluate the effectiveness of the android-based e-LKPD for service company worksheets through large-group product trials.

Method

This research was conducted at SMKN 1 Medan, locates at jalan sindoro No. 1, Pusat Pasar, Medan Kota District. During the even semester of the 2024/2025 academic year. The research subjects consisted of three validators :

two material experts and one media expert. The type of research used is Research and development (R&D) with the 4D model by thiagarajan, which includes four stages:

1.) Define stage the initial step in this research involved interviews and analysis of the teaching material needs of students, as well as an analysis of learning objectives or ATP. This study also analyzed two accounting books for grade X and e-books used as a guide in creating the e-LKPF material.

2.) Design stage at this stage, the researcher designed a draft of the LKPD, which will be developed into an e-LKPD. the design considers the strengths and weaknesses of the textbooks that were analyzed. The developed LKPD follows the format of e-LKPD learning in line with the Merdeka Curriculum. Once the LKPD draft is completed, the document will be converted into PDF, JPG, and PNG formats.

3.) Develop stage at this stage, the android-based e-LKPD is developed. This process involves validator by media and material experts, as well as measuring the responses of educators and accounting teacher, the stages of the develop process consist of :

a) e-LKPD validation validation is carried out by experts to assess contents feasibility, presentation feasibility, graphic feasibility, and language feasibility.

b) e-LKPD practicality this stage is conducted by distributing questionnaires to students and accounting teacher. A small-scale trial involves six grade X students selected purposively.

- 2 students with high academic ability (categorized as excellent)
- 2 students with moderate academic ability (categorized as average)

- 2 students with low academic ability (categorized as poor)

c) e-LKPD effectiveness a large-scale trial is conducted with 34 students using a post-test to evaluate students responses and their level of interest in using the e-LKPD.

4.) Disseminate this stage involves the dissemination or promotion of the final product hat has been develop[ed and revised to the users, namely the students. This dissemination is carried out on a small scale.

Data analysis is the process of processing data to find solution to a problem. In this study, the data analysis stage involves three techniques:

1) Validation Analisisi Tecnique ,

The results can be analyzed by collecting information to obtain answers through questions arranged in the form of validation instruments for media and material feasibility. Then, data tabulation is carried out according to the predetermined classification. Scores are given based on the responses from lectures and teachers. The scoring responses and validator instruments is conducted using a likert scale. according to (rahman, 2024), the likert scale is presented in Table 1.

Table 1 *Kriteria Skala Likert*

Kriteria	Score
Strongly Agree (SA)	4
Agree (A)	3
Disagree (D)	2
Strongly Disagree (SD)	1

The data obtained is then calculated using the percentage formula to determine the validation score from media and material experts using the following formula:

$$P = \frac{f}{N} \times 100\%$$

Explanation:

P = Percentage score in percent (%)

f = Total score from data collection

N = The highest possible score

To analyze the percentage of validation scores from media experts, the validation criteria according to (Ilyasa Aghni & Noorma Novida Siregar, 2021) can be used, as presented in Table 2.

Table 2 Persentase Kriteria Validasi

Persentase (%)	Kriteria
81-100	Very Valid
61-80	Valid
41-60	Fairly Valid
21-40	Less Valid
0-20	Invalid

2) Practicality Analisisi Techniquw of e-LKPD

The instrument used in this research is a non-test instrument in the form of a questionnaire, aimed at identifying the responses of students and accounting teachers toward the e-LKPD. The practicality results are analyzed through questions arranged in the questionnaires for students and accounting teachers. Subsequently, data tabulation is carried out based on predetermined classifications, and scores are assigned to the responses using the same formula as the validation process. The practicality results from the student and teacher questionnaires can then be understood through the practicality criteria according to (Ilyasa Aghni & Noorma Novida Siregar, 2021), as presented in table 3.

Table 3 Table of practicality criteria

Persentase (%)	Kriteria
81-100	Very Practical
61-80	Practical
41-60	Fairly Practical
21-40	Less Practical
0-20	Impractical

3) Effectiveness Data Analysis Technique of e-LKPD.

Effectiveness analysis is conducted to measure the success of the e-LKPD by examining the percentage of students who achieve mastery learning. A class is considered effective if 85% of the students obtain a score above 79%.

Result and Discussion

The results of this study are an evaluation of the e-LKPD developed with the assistance of liveworksheet. This research was conducted through several stages according to the development model, namely: 1) Define stage,

At this stage, information was gathered regarding the need for teaching materials and the essential elements required for developing the e-LKPD. data collection was carried out through interviews with accounting teacher and

distributing quwationnaires to students. The results of theinterviews with accounting teachers showed a positive response to the use of android-based e-LKPD assisted by Liveworksheet. Accounting to the teachers, this e-LKPD has the potential to improve students learning outcomes by providing a more flexible and interactive learning experience. The inclusion of game elements within then e-LKPD is expected to prevent students from feeling bored and to motivate them to study more actively. Based on the a analysis of teaching material needs, the questionnaire results revealed that the majority of students consider mobile phones and digital techology to play a crucial role in supporting the learning process, especially in basic accounting subjects.

2) Develop Stage

At this stage, the researchers evaluated the product being developed. The material feasibility was assessed by two validators: a lecturer from the faculty of Economics at Medan State University and Accounting teacher.the validator results indicated that the e-LKPD developed was deemed suitable for use as teaching material. The results of material feasibility can be seen in tables 4 and 5.

Table 4 The results of the accounting teacher's material validation.

Assessment aspects	Validation results
Content feasibility	44
Language feasibility	15
Persentation feasibility	27
Total	86
Average	3,5
Percentage	89,5%
Category	Highly valid

Table 5 The results of the economics lecturer's material validation.

Assessment aspects	Validation results
Content feasibility	45
Language feasibility	19
Persentation feasibility	27
Total	91
Average	3,8
Percentage	95%
Category	Highly valid

The media expert validation conducted by one material validator resulted in a "highly valid" category, with a notes tating it can be used

without revision. The material feasibility result can be seen in table 6.

Table 6 Aspects of media assessment

Assessment aspects	Validation results
E-LKPD Size	7
E-LKPD Cover Design	21
E-LKPD Content Design	72
Total	100
Average	3,7
Percentage	92,5
Category	Highly valid

The following are criticisms from material and media expert validators that can be used to improve the e-LKPD.



Image 1 The previous main menu

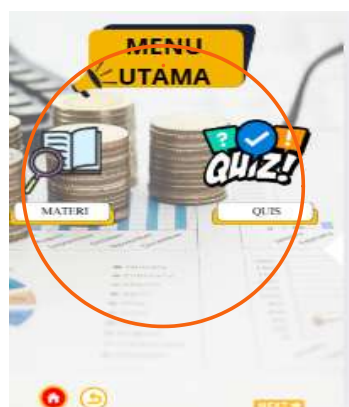


Image 2 The revised menu image



Image 3 instruction for completion before revision



Image 4 instruction for complet after revision

The practicality validation of the e-LKPD was carried out by distributing questionnaires to teachers and students to assess their responses to the e-LKPD. the results of the accounting teacher and student responses can be see in tables 7 and 8.

Table 7 practicality validation of accounting teacher

Assesment Componen ts	Assessme nt Percentage	Averag e	Practicali ty Categori
Criteria	91%		Very
Material	91%	88,8%	Practical
Language	83,3%		

Table 8 Practicality Validation through student responses

Assesment Components	Assessme nt Percentage	Averag e	Practicality Category
Criteria	82,7%		Very
Material	80,5%	82%	Practical
Language	82,9%		

The expert validation of effectiveness was conducted in grade X, involving 35 respondents through a post-test. The large group analysis was carried out after the product finalization, which was adjusted based on feedback from validators and small group trial. The post-test included in the e-LKPD aimed to measure students understanding after participating in the learning process, in order to evaluate the effectiveness of the e-LKPD in enhancing their comprehension of basic accounting material. The results of the large group test can be seen in Table 9.

Table 9 Student post-test results

Score Interval	Posttest	
	Number of Students	Percentage
81-100	14 Students	40%
75-80	16 Students	45,7%
60-75	4 Students	11,3%
0-59	1 Students	3%

The results of the large group trial showed that 30 out of 35 students achieved a score of 75, indicating that they met the Minimum Mastery Criteria (MMC). The pass percentage is calculated as follows:

$$\frac{30}{35} \times 100\% = 85,7\%$$

This percentage falls into the very good category.

Conclusion

The development of the android-based e-LKPD assisted by liveworksheet in basic accounting subjects at SMKN 1 Medan follow the 4D model (define, design, develop, disseminate) by Thiagarajan . the validation results indicate that the e-LKPD is categorized as highly feasible, highly practical, and highly effective for use in the learning process. Based on BSNP standards, the feasibility of the e-LKPD is reflected in several aspects : content feasibility scored 92,3% (highly feasible), presentation feasibility received 95% (highly feasible), language feasibility achieved 96% (highly feasible), and media feasibility obtained 94% (highly valid). The practicality of the e-LKPD was tested through small group trial involving teachers and students. Teacher responses showed that the aspect of interest and language both scored 91,6%, categorized as (highly practical), while language feasibility reached 83,3%, also categorized as (highly practical). Meanwhile, student responses revealed that interest scored 82,6% (highly practical), material comprehension reached 80,5% (practical), and language received 82,9% (highly practical). The effectiveness of the e-LKPD was evaluated through large group trials and post-tests, whit students pass rate reaching 85,7%, which falls into the very good category.

References

- Apriliyani, S. W., Mulyatna, D. F., & Artikel, S. (n.d.). *Sita Wahyu Apriliyani & Fauzi Mulyatna/Flipbook E-LKPD dengan Pendekatan SINASIS 2 (1) (2021) P r o s i d i n g S e m i n a r N a s i o n a l S a i n s Flipbook E-LKPD dengan Pendekatan Etnomatematika pada Materi Teorema Phytagoras Info Artikel Abstrak.*
- Ghaisani, N. R. T., & Setyasto, N. (2023). Development of Liveworksheets-Based Electronic Student Worksheets (E-LKPD) to Improve Science Learning Outcomes. *Jurnal Penelitian Pendidikan IPA*, 9(8), 6147–6156. <https://doi.org/10.29303/jppipa.v9i8.4571>
- Ilyasa Aghni, R., & Noorma Novida Siregar, M. (2021). PENGEMBANGAN MEDIA PEMBELAJARAN BERBASIS AUDIO-VISUAL UNTUK E-LEARNING MATA KULIAH KURIKULUM DAN PEMBELAJARAN AKUNTANSI The Development of Audio-Visual Based Learning Media for E-Learning Course Content of Curriculum and Accounting Learning. In *Jurnal Pendidikan Akuntansi Indonesia* (Vol. 19, Issue 1).
- Nufus, V. F., & Sakti, N. C. (2021). Pengembangan Lembar Kerja Peserta Didik Elektronik Berbasis Flipbook Pada Mata Pelajaran Ekonomi Kelas XI. *Jurnal PTK Dan Pendidikan*, 7(1). <https://doi.org/10.18592/ptk.v7i1.4633>
- Prabowo, A. (2021). Penggunaan Liveworksheet dengan Aplikasi Berbasis Web untuk Meningkatkan Hasil Belajar Peserta Didik. *Jurnal Pendidikan Dan Teknologi*

- Indonesia, 1(10), 383–388.
<https://doi.org/10.52436/1.jpti.87>
- Putri, K. A., & Susilowibowo, J. (2023). Pengembangan E-LKPD Berbasis Higher Order Thinking Skill (Hots) di Kelas X SMK PGRI Se-Sidoarjo. *Jurnal Basicedu*, 7(3), 1684–1693.
<https://doi.org/10.31004/basicedu.v7i3.5867>
- Rahayuningsih, Y. S., & Muhtar, T. (2022). Pedagogik Digital Sebagai Upaya untuk Meningkatkan Kompetensi Guru Abad 21. *Jurnal Basicedu*, 6(4), 6960–6966.
<https://doi.org/10.31004/basicedu.v6i4.3433>
- rahman, arif. (2024). *Penelitian kuantitatif kualitatif dan RnD*. 1–193.
- Rahmawan Putra, D., & Adhi Nugroho Staf Pengajar Jurusan Pendidikan Akuntansi Universitas Negeri Yogyakarta, M. (n.d.). PENGEMBANGAN GAME EDUKATIF BERBASIS ANDROID SEBAGAI MEDIA PEMBELAJARAN AKUNTANSI PADA MATERI JURNAL PENYESUAIAN PERUSAHAN JASA DEVELOPING ANDROID BASED EDUCATIONAL GAME AS A MEANS OF ACCOUNTING LEARNING ON SERVICE COMPANY ADJUSTING JOURNAL MATERIAL Oleh. In *Jurnal Pendidikan Akuntansi Indonesia: Vol. XIV* (Issue 1).
- Ramadhani, A. (2024). Pengembangan LKPD Berbasis Game Untuk Meningkatkan Berpikir Kritis Siswa Kelas III Sekolah Dasar. In *Jurnal Kependidikan* (Vol. 13, Issue 2). <https://jurnaldidaktika.org>
- Sari, A. A. (n.d.). *PENGEMBANGAN e-LKPD BERBASIS PROBLEM BASED LEARNING (PBL) DENGAN LIVEWORKSHEETS PADA MATERI ASAM BASA DEVELOPMENT OF ELECTRONIC STUDENT WORKSHEET BASED ON PROBLEM-BASED LEARNING (PBL) ON ACID BASE MATERIAL CLASS XI*.
- Sari, E. N., & Susilowibowo, J. (2022). Pengembangan E-LKPD Berbasis HOTS Pada Mata Pelajaran Praktikum Akuntansi Lembaga Kelas XI Semester 2. *EDUKATIF : JURNAL ILMU PENDIDIKAN*, 4(3), 4469–4483.
<https://doi.org/10.31004/edukatif.v4i3.2709>
- Setiawan Negeri Karangpelem, A. S. (n.d.). *Workshop Penguatan Kompetensi Guru 2021 SHEs: Conference Series 4 (6) (2021) 290-296 Problem Based Learning (PBL) Model For The 21st Century Generation*. <https://jurnal.uns.ac.id/shes>

Curriculum Vitae

Putri Rahmadani Sitorus was born in Binjai Serbangan, Community VII, Air Joman, on November 13, 2002. She is currently an 8th-Semester student in the Accounting Aducation Study Program, Faculty of Economics, at Universitas Negeri Medan. This semester, she is focusing on comoleting her final project, which involves the development of an android-based e-LKPD for Basic accounting subject. This article is written as part of the completion of her final project