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Development of E-LKPD Assisted by flipHTML5 Based on Problem-Based Learning to Train Students' Critical Thinking Skills

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ABSTRAK

The background of this study is the limited accessibility of interactive educational resources and the low level of student engagement and critical thinking skills in economics learning. This study aims to develop a FlipHTML5-assisted Electronic Student Worksheet (E-LKPD) based on Problem-Based Learning (PBL) for the topic of human needs for tenth-grade students at Batanghari 1 State Senior High School. This study used the Development and Research (R&D)) method with a 4-D model, which consists of define, design, development, and disseminate stages. The test subjects were 27 tenth-grade students, while the feasibility of the media was assessed by three validators consisting of media experts, subject matter experts, and language experts. Data were collected through validation questionnaires and student response questionnaires, then analyzed using validity and practicality percentages based on the Likert scale. The validation results showed that the developed E-LKPD was in the valid to highly valid category, with a validity percentage of 91% from media experts, 80% from subject matter experts, and 91% from language experts. The practicality test through student responses produced an average percentage of 92% in the very practical category. These findings indicate that PBL- based E-LKPD assisted by FlipHTML5 is suitable for use as an economic learning medium and has the potential to train students' critical thinking skills on human needs material. Theoretically, this study expands the body of research on the use of Problem-Based Learning-oriented E-LKPD in economic acquiring knowledge in the digital age by using the FlipHTML5 platform as a presentation medium. Practically, the resulting E-LKPD can serve as an alternative medium and a reference for economics teachers in designing more interactive and accessible learning, and has the potential to be adapted to other materials and different levels of education.

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1. INTRODUCTION

Education has a big effect on how the quality of human resources and determining the direction of a country's development. Through quality education, the community is equipped with the knowledge, skills, and character required to face the challenges of the 21st century (Silalahi et al., 2022). In Indonesia, the government and education stakeholders continue to strive to make learning better by various policies and innovations at the school level, one of which is the development of more varied and interactive learning media (Sari, 2019). However, the national education system still faces a number of fundamental problems, such as low graduate quality, high dropout rates, and suboptimal use of learning media at various levels (Anton et al., 2025). Based on 2023 data from the Central Statistics Agency (BPS) presented by the Coordinating Ministry for Human Development and Culture, the gross enrolment rate (GER) for higher education in Indonesia has only reached 31.45%. This achievement is still far below Singapore's 91.09% and Malaysia's 43% (Fitriani et al., 2023). One of the causes is the limitation of innovative and interactive learning media, which has an impact on the low critical thinking skills of students (Annisa et al., 2020). In this context, the development of technology-based learning media is an important solution to increase student engagement and understanding (Said, 2023).

SMA Negeri 1 Batanghari is one example of a school facing problems related to media learning. based on conversations with economics teachers at the school, the learning media used are still limited to printed books and the use of smartphones, which is ineffective. Additionally, pupils typically exhibit passivity in The education process and are not trained in critical thinking, they tend to wait for the teacher's instructions rather than constructing their own understanding. The fact that critical thinking skills are low is because teachers often associate learning problems with understanding learning materials, while students find it difficult to understand complex and abstract materials (Devi, 2022). In fact, critical thinking skills are very important to prepare students to face complex challenges in the digital age (Cynthia & Sihotang, 2023). Innovative learning media are therefore necessary that are not only engaging but also encourage students to actively think and solve problems.

One approach that is considered effective for training critical thinking and problem-solving skills is Problem-Based Learning (Rachmawati & Rosy, 2021),). PBL is a learning model that places students as the main subjects of learning. The learning process begins with the presentation of a real-world problem that is relevant to students' lives, encouraging them to analyse, seek information, and develop solutions independently or in groups. Through this active involvement, PBL not only helps students understand concepts but also develops their critical thinking and problem-solving skills (Putri et al., 2025) Husna et al., 2025). PBL is a student-centred learning model, where learning begins with real-world problems to stimulate independent exploration and collaboration (Darwati & Purana, 2021). PBL has been proven to increase learning motivation and students' analytical skills (Reski et al., 2019) However, the implementation of PBL requires interactive and easily accessible supporting media.

At this point, the Electronic Student Worksheet (E-LKPD) assisted by FlipHTML5 can play a role. E-LKPD is a digital version of student worksheets that integrates text, illustrations, videos, and various interactive activities to support independent learning and teacher-guided learning(Arini, 2023). According to (Ramadani, 2025) the Electronic Student Worksheet (E-LKPD) is a development of the conventional student worksheet (LKPD) that has been converted to a digital format so that it can be used on various technological devices such as smartphones. The content of E-LKPD is not limited to a collection of questions and problems, but includes a series of learning activities that are systematically arranged, starting from the presentation of material, the provision of stimuli, to explanations of the steps that need to be taken by students (Kamila, 2022).

FlipHTML5 is a web-based digital publishing platform that provides facilities for converting static teaching materials, such as printed documents or PDF files, into interactive flipbooks that resemble

physical books but are enriched with multimedia elements, such as videos, audio, animations, and links. With a simple interface that does not require special programming skills, teachers can repackage teaching materials into digital pages that are more lively and interesting for students (Jauharati et al., 2022). FlipHTML5 was chosen for its ability to convert static documents into interactive flipbooks with easy navigation (Miranda, 2023). In this study, FlipHTML5 was used as a platform to present E-LKPD designed with a Problem-Based Learning (PBL) approach. FlipHTML5's features, which allow the combination of text, images, infographics, and problem-triggering videos, are in line with the characteristics of PBL, which requires authentic problems and a focused investigation process (Laili, 2023). The display of each flipbook page can be arranged according to the PBL stages, starting from problem introduction, organisation of student tasks, investigation activities, to the presentation of results and reflection activities, so that the learning steps in E-LKPD are arranged more coherently. FlipHTML5's ability to be accessed through various devices, including smartphones, is also in line with the conditions at SMA Negeri 1 Batanghari, where many students already use gadgets but are not yet supported by adequate interactive learning media. Therefore, the selection of FlipHTML5 in this study is not merely a technical consideration, but also a pedagogical strategy to optimise the function of E-LKPD as a medium that encourages active learning while training critical thinking skills on the subject of human needs

This study aims to develop PBL-based E-LKPD assisted by FlipHTML5 to train the critical thinking skills for tenth-grade students on human needs material at Batanghari 1 State Senior High School. The significance of this study lies in its potential to: (1) provide innovative and accessible learning media, (2) maximise the use of technology in education, and (3) provide practical solutions for teachers and students in dealing with the limitations of conventional media. The hypothesis of this study is that the integration of PBL in E-LKPD will significantly increase student engagement and train their critical thinking skills, as measured by indicators (Facione, 2013), such as interpretation, analysis, and evaluation.

The main objective of this study is to produce valid and practical E-LKPD through a 4-D model consisting of four systematic stages, namely Define, Design, Development, and Disseminate. Preliminary conclusions indicate that this product is expected to be an effective alternative for economics learning, particularly in the subject of human needs. This research also opens up opportunities for further development, such as large-scale effectiveness testing or adaptation for other subjects. Thus, this study is not only relevant to educators and researchers in the field of economic education, but also contributes to broader efforts to improve the quality of learning through the integration of technology and student-centred approaches. Methodologically, this study uses a research and development (R&D) approach with a 4-D model (Define, Design, Development, Disseminate) to produce a valid and practical FlipHTML5-assisted PBL-based E- LKPD for human needs material for for tenth-grade students at Batanghari 1 State Senior High School.

2. METHOD

2.1 Development Method

This study employs the R&D method with the 4-D model developed by Thiagarajan. This model is made up of four systematic stages, namely Define, Design, Development , and Disseminate . Due to its structured procedure, The 4-D model was selected.as the development framework in this study, with the progress explained paragraph below:

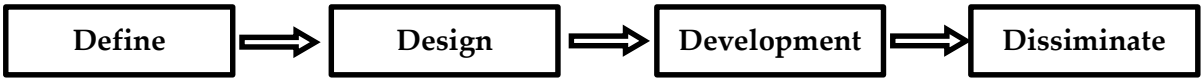


Figure 1. Development of the 4-D model

2.2 Development Procedures

Define

This stage seeks to identify and specify the learning requirements.The steps include:

1. ***Analysis of Front-end:*** Front-end analysis aims to identify the main issues that arise in economics learning at Batanghari 1 State Senior High School, particularly on the topic of human needs. The researcher conducted a pre-survey of tenth-grade students through initial observation and information gathering on the implementation of learning. This information was used to map needs and became the starting point for designing E-LKPD that was relevant to the actual conditions in the classroom.
2. ***Student and Teacher Analysis***: At this point, the investigator examined the characteristics of students, such as their initial abilities, interests and attitudes towards economics lessons, and their level of independence in learning. On the other hand, the researcher also examined the obstacles experienced by teachers, such as limited media, students' inadequate capacity for critical thought, and the underutilisation of smartphones as a learning tool. The results of this analysis are used to adjust the teaching material design to the needs, characteristics, and learning environment of the students.
3. ***Concept Analysis:*** Concept analysis is conducted to select and organise the material to be presented in the E-LKPD, namely material on human needs. Key concepts are arranged sequentially with reference to the Merdeka Curriculum and various relevant references, so that the flow of material in the E-LKPD helps students understand the interrelationships between concepts in stages.
4. ***Task Analysis***: At this stage, researchers identify the types of tasks that can develop the main and supporting skills targeted in learning. Tasks are designed in line with PBL syntax, thereby encouraging students to actively examine problems, discuss, and formulate solutions. All tasks are ensured to be in line with learning outcomes and the requirements of the Merdeka Curriculum on human needs material.
5. ***Specification of Objectives:*** In light of the findings of the four previous analyses, the researcher set specific development objectives, namely to produce a PBL-based E-LKPD on human needs material that is valid and practical, and able to help students be more active, focused, and trained in critical thinking. These objectives became the reference in compiling the content, activities, and appearance of the E-LKPD that was developed.

Design

The design stage is focused on developing a preliminary draft of the PBL-based E-LKPD, which will be further developed through a series of steps, including the following:

1. ***Format Selection:*** At this stage, the final form of the E-LKPD is determined, starting from the selection of content that focuses on human needs material along with case studies and supporting exercises, the preparation of main components (such as the cover, foreword, learning objectives, core material, activity sheets, and report format), to the visual layout so that it is easy to read and attractive to students. All E-LKPD content is compiled in line with the five main steps of the PBL model, so that the sequence of learning activities flows from problem introduction to reflection activities. The finished product is then uploaded and processed through the FlipHTML5 platform, transforming it into an interactive digital flipbook that can be easily accessed by students, both for independent learning and face-to-face learning.
2. ***Initial Design***: This stage focuses on preparing the first draft of PBL-based LKPDs with reference to the planned format. The draft contains an introduction, presentation of main material, student assignment or activity sheets, and a template for work reports. Each section is designed to follow the sequence of problem-based learning phases, starting from the introduction and formulation of problems, grouping and directing students, the investigation process, the compilation and presentation of results, to assessment and reflection activities. In addition, the integration of material

flow, clarity of work steps, and the suitability of tasks with learning objectives and critical thinking indicators to be developed are also reviewed.

Development

This stage realises the product design into PBL-based E-LKPD. The LKPD components (cover, introduction, material, PBL phase, project procedures) are systematically arranged and enriched with attractive images. The product is then validated:

- Media Expert Validation: Assessment of media suitability by Economics Education lecturers for product improvement.
- Content Expert Validation: Assessment of the quality and suitability of the material by experts for content refinement.
- Language Expert Validation: a process of linguistic assessment or examination to ensure that the language used is communicative, appropriate to the students' level of thinking, and does not cause ambiguity.
- Product Testing: Offline testing of PBL-based E-LKPD on for tenth-grade students at SMA N 1 Batanghari to obtain feedback on ease of use.

Disseminate

The final stage aims to disseminate the E-LKPD product. Dissemination is carried out by distributing the product to 10th grade students at SMA N1 Batanghari and submitting it to the school for wider use.

Data Collection Instruments

1. ***Observation:*** The observation technique was used by directly observing the learning process in the classroom and the learning behaviour of the students. Through this activity, the researcher recorded the classroom situation, the level of student activity, the way the teacher delivered the material, and the use of available media. The data from the observation was then used as a basis for determining the actual learning conditions before the E-LKPD was implemented.
2. ***Interviews***: The next instrument was face-to-face interviews with the economics teacher, Mrs Ledy Tresya, S.Pd, and several students from Batanghari 1 State Senior High School. These interviews aimed to explore more in-depth information regarding the difficulties experienced by students, their learning media needs, and their responses to the ongoing learning process. The interview results helped the researcher adjust the E-LKPD design to the needs of teachers and students in the field.
3. ***Documentation***: The documentation technique was carried out simultaneously with the observation and interviews, both with the economics teacher and the Year 10 students of SMA Negeri 1 Batanghari. The researcher collected various supporting documents, such as photos of learning activities, copies of teaching materials, and other relevant notes during the research process. These documents were used as complementary and supporting evidence for the findings obtained from the observation and interviews.
4. ***Questionnaire:*** In this study, 27 for tenth-grade students at SMA N 1 Batanghari became respondents who filled out questionnaires face-to-face with researchers in a conducive atmosphere so that the data obtained was valid and objective. To analyse the respondents' answers, the researcher employed a Likert scale. As stated by Riduwan and Akdon (2020:16), the Likert scale serves to measure the beliefs and viewpoints or opinions of people or groups regarding a social phenomenon. This scale breaks down variables into several indicators that form the basis for compiling items in the form of questions or statements, which are then presented in a table where respondents mark (√) the option that best reflects their views. The following is a grid table for interpreting scores.

Table 1. Score Interpretation List using the Likert Scale

Answer Criteria	Skor
Very Valid	5
Valid	4
Fairly valid	3
Not valid	2
Not valid	1

Data Analysis Techniques

The researcher analysed the data by grouping the collected information to make it easier to understand and draw conclusions from the research results. After the product validation questionnaire was completed by the validators and the response questionnaire by the students, the next step was to calculate The validity percentage and practicality of The educational media that had been developed. For this purpose, testing was carried out using the following methods:

Validity Test

The formula used to manage all data according to (Riduwan & Akdon, 2020) is as follows :

$$\text{Percentage} = \frac{\sum score\ given\ by\ the\ validator}{\sum maximum\ score} 100\%$$

The validity criteria for the resulting product will be stated:

Table 2. Product validity assessment criteria

Answer Criteria	Rating Scale	Assessment
Highly valid	5	81 <*N*≤ 100
Valid	4	61 <*N*≤ 80
Sufficiently Valid	3	41 <*N*≤ *60*
Not Valid	2	21 <*N*≤ *40*
Highly Invalid	1	0 <*N*≤ *20*

Based on the criteria set previously, if the data collection results show a percentage above 60%, then the E-LKPD development product based on Problem-Based Learning (PBL) can be declared feasible for testing on students. According to Riduwan and Akdon (2020:18), a study is considered valid if all aspects of assessment by subject matter experts and media experts obtain a score between 61 and 80, which falls into the "strong" validity category.

Practicality Test

The formula used to manage all data according to Riduwan and Akdon (2020:18) is as follows:

$$\text{Prescentage} = \frac{\sum scores\ given\ by\ students}{\sum maximum\ score} 100\%$$

The practicality criteria of the product produced will be stated:

Tabel 3. Product practicality criteria

Criteria Response	Rating Scale	Assessment
Very practical	5	81 <*N*≤ 100
Practical	4	61 <*N*≤ 80
Fairly Practical	3	41 <*N*≤ 60
Not Practical	2	21 <*N*≤ 40
Highly impractical	1	0 <*N*≤ 20

Based on the criteria described above, if the percentage of data obtained is more than 60%, the development product is considered suitable for use by students. According to Riduwan and Akdon

(2020:18), a study is considered practical if all aspects assessed through the student response questionnaire obtain a score between 61 and 80, which falls into the practical category.

3. FINDINGS AND DISCUSSION

The digital learning media developed in this study used the 4D development model. This model comprises four main stages, namely the definition stage, the design stage, the development stage, and the dissemination stage (Thiagarajan et al., 1974). During the definition stage, evealed that tenth-grade students still needed more interesting learning media that was more interesting, contextual, and capable of increasing active engagement. Therefore, the development of PBL-based E-LKPD was chosen as the solution. The design stage produced a preliminary product design that included learning objectives, E- LKPD format, and PBL-based materials and questions compiled with reference to the relevant curriculum and learning resources.

Next, during the development stage, the E-LKPD that had been compiled was confirmed by language experts, subject matter experts, and media specialists, with assessment results ranging from valid to highly valid. It was then tested on students to determine its practicality. Meanwhile, the dissemination stage is planned as a step to utilise the media more widely through teachers and schools, so that the PBL-based E-LKPD produced is not only used by the test subjects, but also has the potential to be applied in other similar learning contexts. A more detailed description of each stage of the 4D model and the research findings is presented in the following subsection.

3.1 Define

The definition stage is the initial step in this research, which aims to gather important information in designing the product and identifying problems. which is useful for etermining the appropriate solution (Husnayayin et al., 2024). A series of activities in this stage included observing the learning process in tenth-grade students, interviewing students, and interviewing the economics teacher, Mrs Ledy Tresyha, S.Pd. In this stage, five types of analysis were conducted, namely front-end analysis, student and teacher analysis, concept analysis, objective analysis, and specification of objectives as stated in the introduction.

Based on the five stages carried out in this study, it can be concluded that tenth-grade students at SMA N 1 Batanghari require effective learning media to solve the problems faced by students and encourage active involvement in the learning process. Therefore, the development of E-LKPD media based on Problem-Based Learning (PBL) is considered a relevant and appropriate solution to meet these needs.

3.2 Design

The design stage is the initial stage in the product design process, which is formulated based on the results of problem identification and requirements in the previous stages (Waruwu, 2024). At this stage, it was determined that the learning media to be developed would be PBL-based E-LKPD as a solution to the problems identified. The design of this media includes various important elements, such as the compilation of material content, visual layout, and the application of PBL syntax, which will serve as the basis for the overall development of E-LKPD.

1. Determining Learning Objectives
   The formulation of learning objectives is compiled by considering the alignment between the learning outcomes in the curriculum and the selected material. This adjustment is intended so that the designed E-LKPD can support the achievement of the targeted competencies and be able to fulfill the needs of students in understanding the material more comprehensively and contextually.
2. Format Selection
   In this study, the researcher developed an E-LKPD format design that integrates the (PBL) approach, taking into account the content of the material to be presented. The format chosen is a PBL-based E-

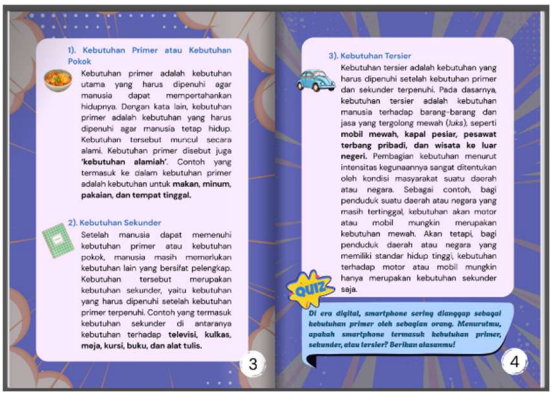
LKPD with specific characteristics, which is specifically designed to support the learning of tenth-grade students.

3. Formulating PBL-Based Material and Questions in Learning Media
   Researchers compiled materials and questions in E-LKPD learning media based on PBL with a focus on the topic of human needs, which covers two main sub- topics: product packaging design and animal food processing. The content development refers to the Merdeka Curriculum Craftsmanship and Entrepreneurship e-book and is supported by various reliable online sources, so that the material developed is comprehensive, up-to-date, and in line with students learning needs.
4. Creating E-LKPD Products
   In designing and developing a learning product, researchers utilised the Canva platform as a design tool to design all the main components needed. These components included determining the E-LKPD title, setting the visual layout, selecting and compiling teaching materials, formulating learning objectives and outcomes, and compiling the PBL learning model stages. The researchers also equipped the E-LKPD with supporting features such as interactive quizzes, a chat boot feature to make it easier for users to ask questions and find answers, additional information, PBL-based assignments, additional materials and reading materials, and final evaluation questions. After all parts were thoroughly designed, the E-LKPD was converted into a flipbook format using flipHTML5. Here, I will present the initial design of the E-LKPD and the design of the E-LKPD that has undergone revision by language, material, and language experts as follows:

Table 4. Comparison of E-LKPD design before and after expert validation

	Before	After
1.		
	The layout of the images is not neatly arranged.	Image layouts that have been grouped according to need.
2.		
	The table of contents is not yet interactive and the media is still monotonous.	An interactive table of contents using hyperlink features and a chat bot feature that assists students in asking questions and finding answers..

3.



Content that is still raw in terms of accuracy and language.

Content that has undergone revision and includes supporting materials accessible via QR code

3.3 Development Stage

At this stage, the researcher carried out the development of learning media designed in accordance with the initial design and research objectives, namely to create valid and easy to use learning media. After obtaining input from the supervising lecturer, the product that had been compiled was then evaluated through a validation procedure by specialists in the field, the subject, and the language to assess its validity. To assess its practicality, the researcher conducted a trial with 27 tenth-grade students at SMA N 1 Batanghari using a questionnaire developed with a Likert scale. The data from the questionnaire was analysed using validity and practicality formulas based on the method from Riduwan and Akdon. Broadly speaking, this stage covers two main procedures, namely expert validation and practicality testing.

1. Expert validation

After the product has been developed, the next stage is to conduct validation by experts to evaluate the validity of the learning media that has been designed. This validation involves three validators from different fields of expertise. The first validator, Mr Febri Hartono, S.Pd, is a teacher from SMA N 1 Batanghari who acts as an expert in the field of media. The second validator, Mrs. Ledy Treshya, S.Pd., is an economics teacher who provides an assessment from the perspective of material substance. The third validator is Mr. Drs. Ngalimanto, an expert in language. The validation was conducted through a series of structured steps to ensure the quality and suitability of the learning media that has been developed, with the following results:

Media expert validation data

The researcher underwent validation by the media expert, Mr. Febri Hartono, S.Pd. This validation aimed to evaluate the quality and validity of the developed product. The assessment results from the media expert, obtained through a questionnaire, are presented in the following table:

Table 5. Data from the Media Expert Validation Questionnaire

Aspects evaluated	Validator score	Percentage	Criteria
1	5	100%	Highly Valid
2	5	100%	Highly Valid
3	5	100%	Highly Valid
4	5	100%	Very Valid
5	4	80%	Valid
6	4	80%	Valid
7	5	100%	Highly Valid
8	5	100%	Highly Valid
9	4	80%	Valid
10	4	80%	Valid
11	4	80%	Valid
12	5	100%	Highly Valid
13	5	100%	Highly Valid
14	4	80%	Valid
15	5	100%	Highly Valid
16	5	100%	Highly Valid
17	4	80%	Valid
Total	**78**	**1540%**	**Highly Valid**
Average	**4.58**	**91%**	**Highly Valid**

From the table, it can be seen that the total score given by the validator reached 78 with a percentage of 91%, thus falling into the highly valid category and suitable for use. With the validation results from this media expert, it can be concluded that it has met the validity criteria and is ready to be tested on students.

Subject matter expert validation data

The E-LKPD product was then tested for validity by subject matter experts to ensure that its quality met optimal standards. The data from the subject matter experts validation assessment is presented in the following table:

Table 6. Data from the Expert Validation Questionnaire

Aspects evaluated	Validator Score	Percentage	Criteria
1	4	80%	Valid
2	4	80%	Valid
3	4	80%	Valid
4	4	80%	Valid
5	4	80%	Valid
6	4	80%	Valid
7	4	80%	Valid
8	4	80%	Valid
9	4	80%	Valid
10	4	80%	Valid
11	4	80%	Valid
12	4	80%	Valid

13	4	80%	Valid
14	4	80%	Valid
15	4	80%	Valid
16	4	80%	Valid
17	4	80%	Valid
Total	**68**	**1360%**	**Valid**
Average	**4.0**	**80%**	**Valid**

According to the information in the table, validation was carried out using 17 assessment criteria. The validator gave a total score of 68 with a percentage of 80%, which falls into the valid category. The results of the validation recapitulation by subject matter experts show that the learning media has a validity level of 80%, so it is considered valid and suitable for testing on students

Language Expert Validation Data

The E-LKPD product was then tested for validity by language experts to ensure that its quality met the optimal standards. The data from the linguistic specialists' validation evaluation is presented in the following table:

Table 7. Data from the Language Expert Validation Questionnaire

Aspects evaluated	Validator Score	Percentage	Criteria
1	4	80%	Valid
2	4	80%	Valid
3	5	100%	Highly Valid
4	5	100%	Highly Valid
5	5	100%	Highly Valid
6	4	80%	Valid
7	4	80%	Valid
8	5	100%	Highly Valid
9	5	100%	Highly Valid
10	5	100%	Highly Valid
11	4	80%	Valid
12	4	80%	Valid
13	4	80%	Valid
14	4	80%	Valid
15	5	80%	Valid
16	5	100%	Highly Valid
17	5	100%	Highly Valid
Total	**77**	**1540%**	**Highly Valid**
Average	**4,52**	**91%**	**Highly Valid**

Based on the data in the table, validation was carried out using 17 assessment criteria. The validator gave a total score of 77 with a percentage of 91%, which falls into the highly valid category. The results of the validation recapitulation by subject matter experts show that the learning media has a validity level of 91%, so it is considered highly valid and suitable for testing on students

Product trial

After the learning media was declared valid by the validators, the next step in this study was to test the media. The trial was conducted in tenth-grade students with the aim of assessing the practicality of

using E- LKPD in the learning process. Through this stage, the researcher obtained an overview of the actual application of learning media in teaching and learning activities.

The trial data was collected by distributing practicality questionnaires to 27 tenth-grade students at SMA N 1 Batanghari on Friday, 21 November 2025. Of this total, 27 students were selected as samples to complete the questionnaire, which contained 17 assessment aspects. This questionnaire contained statements designed to measure the practicality of the learning media developed. The results of the practicality questionnaire completed by the students The table above shows you that:

Table 8. Data from the Student Response Questionnaire

No	Respons score student	Precentage	Criteria
1	83	98%	Very Practical
2	76	89%	Very Practical
3	79	93%	Very Practical
4	78	92%	Very Practical
5	84	99%	Very Practical
6	83	98%	Very Practical
7	69	81%	Very Practical
8	82	96%	Very Practical
9	73	86%	Very Practical
10	83	98%	Very Practical
11	83	98%	Very Practical
12	74	87%	Very Practical
13	84	99%	Very Practical
14	81	95%	Very Practical
15	78	92%	Very Practical
16	75	88%	Very Practical
17	84	99%	Very Practical
Total	**1.349**	**1558%**	Very Practical
Average	**79,35**	**92%**	Very Practical

From the data listed in the You can see in the table above that the practicality assessment of the product is based on 17 aspects that were evaluated, with an average percentage of 92%. This percentage falls into the "very practical. The high level of practicality is influenced by the validation process that has been carried out by experts. Therefore, it can be concluded that the developed media is very suitable for use in the learning process.

The high validity scores from language, topic matter, and media specialists indicate that the E-LKPD design developed is highly aligned with the characteristics of the learners and the requirements of human needs. This is inseparable from the development process using a systematic 4-D model, starting from defining learning needs, designing content and appearance based on PBL syntax, to compiling clear assessment instruments. The structure of the E-LKPD, which follows the PBL stages, starting from the presentation of contextual problems, information gathering, group discussions, to the formulation of solutions, helps to ensure that each learning activity supports the learning objectives and critical thinking indicators. In addition, the use of communicative language appropriate to the cognitive development level of students, as assessed by language experts, further strengthens the clarity of the content and minimises the potential for multiple interpretations. Thus, it is only natural that the product is considered valid to highly valid by the validators because in terms of substance, appearance, and language, it meets the criteria for learning media suitability.

From a practical standpoint, the responses of students who reached the highly practical category indicate that E-LKPD is easy to use in the classroom learning process and is able to attract their interest

in learning. The interactive flipbook format powered by FlipHTML5 makes the material more dynamic through a combination of text, images, and problem-based activities, so that students not only read but are also encouraged to explore and discuss. These findings are in line with Annisa, Akrim, and Manurung (2020), who emphasise that innovative learning media contributes to increasing student engagement and critical thinking skills, and supports the research results of Reski, Hutapea, and Saragih (2019) as well as Darwati and Purana (2021) that the application of PBL effectively increases learning motivation and analytical skills. The research support from Arini (2023) and Miranda (2023) on the advantages of E-LKPD and the FlipHTML5 platform in presenting attractive digital teaching materials is also consistent with the practicality test results in this study. Thus, the high level of practicality not only reflects students comfort in using the media but also strengthens empirical evidence that the integration of PBL in digital E-LKPD is a relevant and effective strategy for economics learning.

In general, the findings of the study show that the development of E-LKPD based on PBL assisted by FlipHTML5 is able to address the limitations of learning media and the low critical thinking skills of students at Batanghari 1 State High School. Theoretically, the findings of high validity and practicality reinforce previous research results that emphasise the importance of innovative and contextual learning media for training critical thinking (Annisa, Akrim, & Manurung, 2020), the effectiveness of PBL in increasing student motivation and analytical skills (Reski, Hutapea, & Saragih, 2019; Darwati & Purana, 2021), and the role of E-LKPD and digital platforms in supporting independent learning (Arini, 2023; Miranda, 2023). Practically, the developed product offers an alternative economics learning medium that is easily accessible, interactive, and in line with the demands of the Merdeka Curriculum, so that it can be used as a resource for educators in creating similar teaching materials on human needs or other relevant topics.

4. CONCLUSION

This study produced an E-LKPD based in Problem-Based Learning (PBL) assisted by FlipHTML5 on human needs material for tenth-grade students at Batanghari 1 State Senior High School, which was developed through the 4-D model (define, design, develop, disseminate). The outcomes of the validation showed that the developed media met the feasibility criteria, with a validity percentage of 91% from media experts, 80% from subject matter experts, and 91% from language experts, thus falling into the valid to highly valid category. A practicality test involving 27 students resulted in an average percentage of 92% in the very practical category, indicating that the E-LKPD is easy to use, interesting, and supports active problem-based learning. Thus, the PBL-based E-LKPD assisted by FlipHTML5 is appropriate for usage as an alternative economic learning medium to overcome the limitations of conventional media while training students' critical thinking skills in human needs material. Further research is recommended to test the effectiveness of this E-LKPD in enhancing academic performance and critical thinking abilities on a broader scale, as well as adapting similar products to other subjects and levels of education.

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