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Development of E-Worksheet to Enhance with Guided Discovery for Slow Learners

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Abstract

Inclusive education was advocated as an education service system where students with special needs were required to study in nearby schools, participating in regular classes alongside their peers. Slow learner students were thus given the opportunity to study at regular schools and were provided with the same learning materials as other regular students, based on the existing curriculum content. One of the materials studied was a system of linear equations in two variables. This material was identified as one of the materials that proved difficult for slow learners to understand and learn. This was because a system of linear equations in two variables material discussed contextual problems in their solutions, requiring understanding, logical reasoning, and coherent steps for solving. Consequently, solving system of linear equations in two variables contextual problems required critical thinking skills. The study aimed to produce e-worksheet based on guided discovery learning that was valid and practical for improving slow learner students' critical thinking skills in system of linear equations in two variables material. The research followed the ADDIE development stage (Analysis, Design, Development, Implementation, and Evaluation) and focused on grade VIII slow learner students at Junior High School Muhammadiyah 1 Pundong. Instruments included material expert validation sheet instruments, media expert validation sheet instruments, and student response questionnaires. Validation scores met "good" criteria, indicating validity and practicality for student and teacher use.

Keywords: Critical Thinking, E-Worksheet, Guided Discovery Learning

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INTRODUCTION

Learning is an integral part of the educational process which aims to develop thinking skills and improve the construction of new knowledge in order to master the concepts of subject matter (Haris, et al., 2015). In this context, developing critical thinking skills is important because it provides a foundation for students to explain and solve everyday problems (Afridiani, et al., 2020). Critical thinking skills, as described by Duron et al. in Ahdika (2017), refers to the ability to analyze and evaluate information, and make reasonable judgments (Siswanto, 2018; Beyer, 1995). However, challenges arise when slow learner students' critical thinking abilities are less developed, which is caused by a lack of variety in learning strategies implemented by teachers (Setyawan et.al, 2021). To overcome this, it is necessary for the students to find and build their own understanding (Ridho & Setyawan, 2022). One alternative proposed is the application of the guided discovery learning approach, which theoretically can activate students, strengthen critical thinking skills, and stimulate their creativity in solving problems (Imaludin & Fitriani, 2019; Hutagalung, 2017).

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Guided discovery learning is a learning approach that emphasizes the student process of observing, asking questions, making hypotheses, explaining and analyzing to build their own concept of knowledge, with guidance from the teacher (Yuliani & Saragih, 2015). The use of guided discovery learning-based learning tools, such as student worksheets (LKPD), has the advantage of increasing student involvement, training critical thinking skills, and generating learning motivation (Kusumawati, 2015). However, in the context of distance learning which is needed during the COVID-19 pandemic, especially for slow learner students, innovation is needed in providing teaching materials, such as electronic student worksheets (Shinta & Trastuti, 2020).

Slow learner students, who have the characteristics of low learning achievement and difficulty in understanding system of linear equations in two variables material, require a learning approach that suits their needs. To fulfill the rights of every student, including slow learners, to receive quality education, an inclusive approach has been introduced. Therefore, developing teaching materials that suit the needs of slow learner students, such as a system of linear equations in two variables e-worksheet based on guided discovery learning, is important in the context of inclusive education.

RESEARCH METHOD

This research is development research or *Research and Development (R&D)* using the ADDIE model. The aim of this research is to develop a teaching material product, namely guided discovery learning-based e-worksheet on system of linear equations in two variables to improve students' critical thinking skills *slow learner*. The procedures for developing e-worksheets use the ADDIE development model consists of 5 stages (Sugiyono, 2017).

The first stage is analysis stage. At this stage the researcher analyzed the situation and conditions in the field regarding the learning components in the system of linear equations in two variables material at Junior High School Muhammadiyah 1 Pundong. This analysis stage is grouped into three aspects, including: (1) Curriculum analysis. Researchers conducted an analysis of the curriculum focuses on analyzing the learning outcomes. Besides, the researcher also carried out an analysis of the system of linear equations in two variables material; (2) Situation and condition analysis, researchers conduct an analysis of situations and conditions in the learning process both related to the learning methods and models used by teachers. Researchers also analyze the technology or media and learning environment used in learning, as well as the teacher's ability to deliver learning material; (3) Analysis of student characteristics, researchers conducted an analysis of student characteristics *slow learner* which will be the subject of this research. This characteristic analysis aims to find out information about students' abilities, experiences and motivation while studying the system of linear equations in two variables material. In this case, researchers conducted observations and interviews with students and also guidance and counseling teachers to find out the results of psychological test assessments of students who were categorized as slow learner which will be the subject of this research.

The second stage is design stage. Based on the analysis carried out, the next stage is to carry out the design includes selecting the product to be developed. This design stage includes: (1) Selection of products to be developed. In this research, the product to be developed is system of linear equations in two variables E-Worksheet based guided discovery learning to improve slow learner students' critical thinking skills according to the results of the analysis stage: (2) Making preliminary plans. The initial design for developing e-worksheet includes designing the introduction, main part and

conclusion; (3) Developing research instruments. The research instrument used in this research is a product assessment instrument in the form of expert validation (media experts and material experts), initial ability test questions and student response questionnaires. Next, the researcher validated the instruments that would be used in this research with experts.

The third stage is the development stage. At this stage, the researcher compiles a draft of an e-worksheet in accordance with the analysis and design stages. After the draft was compiled, the draft was validated and revised by researchers. Apart from that, validation tests are carried out by validators and then researchers carry out analysis of the validation results. Validation tests include media expert and material expert validation tests. After analysis, the product was repaired according to suggestions and input from validators. After being corrected and valid according to the results of the analysis by media experts and material experts, the e-worksheet based guided discovery learning ready to proceed to the implementation stage.

The fourth stage is implementation. The product that has been developed is then implemented on slow learner students in class VIII at Junior High School Muhammadiyah 1 Pundong as samples in this research. Next, researchers tested the practicality of e-worksheet system of linear equations in two variables based guided discovery learning on slow learner students. To find out the practicality of the teaching materials developed, the researchers gave student response questionnaires. After the results of the practicality analysis of the system of linear equations in two variables e-worksheet based on guided discovery learning have obtained results according to the practicality criteria and practical results have been obtained, it can be continued at the evaluation stage.

The evaluation stage is the final stage of developing teaching materials using the ADDIE model. At this stage, researchers evaluate the results of all stages of the research down to aspects of validity and practicality. The subjects in this research are slow learner class VIII at Junior High School Muhammadiyah 1 Pundong with a total of six students. This research was conducted at Junior High School Muhammadiyah 1 Pundong with the research subjects being six slow learner students in class VIII at the Junior High School. The data sources in this research consist of two types, namely quantitative data and qualitative data. Quantitative data was obtained from the results of validator assessments by material experts, media experts, and slow learner student responses to the e-worksheet being developed. Meanwhile, qualitative data was obtained from validator suggestions from material experts and media experts, as well as student responses to the development of e-worksheets which were expressed in statement sentences.

Data collection techniques in this research include tests and non-tests. Test techniques are used to measure the effectiveness of using e-worksheet system of linear equations in two variables based on guided discovery learning. Non-test techniques consist of e-worksheet assessment questionnaires based on guided discovery learning by material experts and media experts, as well as slow learner student response questionnaires. The aim of using these two techniques is to assess the achievement of e-worksheet according to validity and practical criteria.

The data collection instrument in this research includes several aspects. First, the instrument is to measure validity. According to the Ministry of National Education (2008), the validation sheet consists of four aspects of feasibility, namely appropriateness of: content, language, presentation, and graphics. The validation sheet grid for teaching materials for media experts and material experts is sourced from the

Ministry of National Education (2008) and has been adapted to research needs, especially in the context of the guided discovery learning approach. The media expert validation instrument was modified according to the researcher's needs, namely covering aspects of graphic quality and display design. In this research, an instrument has been developed to measure the practicality of e-worksheets. This instrument uses a student response questionnaire as a measurement tool. This questionnaire assessed several aspects, including students' interest in the material, the content of the material itself, and also the use of language.

Data analysis techniques are used to obtain good quality products that meet the aspects of validity, practicality and effectiveness, especially through qualitative data analysis. The qualitative data analysis process includes organizing data from interviews, field notes, and documentation into relevant categories, then developing them into conclusions that can be easily understood (Sugiyono, 2017). Effectiveness assessment is carried out through triangulation, namely checking data from various sources, methods and times (Sugiyono, 2017). The triangulation methods used include tests, questionnaires and interviews. Data analysis follows the Miles and Huberman stages which consist of data reduction, data presentation, and drawing conclusions (Sugiyono, 2017).

The first step, data reduction, is carried out by summarizing, selecting and focusing on important things, and eliminating those that are not relevant. Data is presented in various forms such as brief descriptions, flowcharts, tables, graphs, and the like, so that the data is organized and easy to understand. The final stage is drawing conclusions, where an evaluation is carried out on the qualifications of the product being developed to see whether it meets valid and practical criteria.

To analyze the validity of e-worksheet, it is carried out quantitatively through assessments from material expert validators and media expert validators which have been adjusted to each statement in Table 1. The validation data is processed by tabulating and determining the average score using the Formula:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad \text{(i)}$$

By representing the average score of e-worksheet by the validator, is the score of the first indicator statement i, and n is the number of assessment items. From the results of calculating the average e-worksheet assessment by the validator, it is matched to the interval class and criteria in the following assessment classification calculation. Next, to provide a classification of assessments by media experts and material experts, the assessment results are calculated to obtain validity with the classification in the following Table 1.

Table 1. Classification of Validity Criteria

No.	Score	Criteria
1	$\bar{x} > x_i + 1{,}8Sb_i$	Very good
2	$x_i + 0{,}6Sb_i < \bar{x} \leq x_i + 1{,}8Sb_i$	Good
3	$x_i - 0{,}6Sb_i < \bar{x} \leq x_i + 0{,}6Sb_i$	Enough
4	$x_i - 1{,}8Sb_i < \bar{x} \leq x_i - 0{,}6Sb_i$	Not enough
5	$\bar{x} \leq x_i - 1{,}8Sb_i$	Very Less

(Widoyoko, 2019)

Information:
$\bar{x}$= average score/validity score
x_i= ideal rate = $\frac{1}{2}$ × (ideal maximum score + ideal minimum score)
Sb_i= Ideal Standard Deviation = $\frac{1}{6}$ × (ideal maximum score - ideal minimum score)
Ideal maximum score = number of criteria items × highest score
Ideal minimum score = number of criteria items × lowest score

Based on the validity classification table, to calculate the number of respondents' scores on the material expert questionnaire with a Likert scale and classification is as follows:
(1) Lowest Score = 1
(2) Highest Score = 5
(3) Ideal Maximum Score = 25 ×5 = 125
(4) Skor Minimum Ideal = 25 × 1 = 25
(5) Ideal rate: $x_i = \frac{1}{2} \times (125 + 25) = \frac{1}{2} \times 150 = 75$
(6) Ideal Standard Deviation: = $Sb_i = \frac{1}{6} \times (125 - 25) = \frac{1}{6} \times 100 = 16{,}67$
From these calculations, the validity range obtained in terms of material is as shown in Table 2.

Table 2. Classification of Validity Criteria in Terms of Material

No.	Score	Criteria
1	$\bar{x} > 105{,}1$	Very good
2	$85{,}00 < \bar{x} \leq 105{,}01$	Good
3	$65{,}00 < \bar{x} \leq 85{,}00$	Enough
4	$44{,}99 < \bar{x} \leq 65{,}00$	Not enough
5	$\bar{x} \leq 44{,}99$	Very less

Based on Table 2, the e-worksheet being developed is declared valid in terms of material if it meets the minimum good criterion. Meanwhile, to calculate the number of respondents' scores on the media expert questionnaire with a Likert scale and classification is as follows:
Lowest Score = 1
Highest Score = 5
Ideal Maximum Score = 11 × 5 = 55
Ideal Minimum Score = 11 × 1 = 11
Ideal Rate = $x_i = \frac{1}{2} \times (55 + 11) = \frac{1}{2} \times 66 = 33$
Ideal Standard Deviation = $Sb_i = \frac{1}{6} \times (55 - 11) = \frac{1}{6} \times 44 = 7{,}33$
From these calculations, the validity range obtained in terms of media is as shown in Table 3.

Table 3. Classification of Validity Criteria in Terms of Media

No	Score	Criteria
1	$\bar{x} > 46{,}19$	Very good
2	$37{,}40 < \bar{x} \leq 46{,}19$	Good
3	$28{,}60 < \bar{x} \leq 37{,}40$	Enough
4	$19{,}81 < \bar{x} \leq 28{,}60$	Not enough
5	$\bar{x} \leq 19{,}81$	Very less

Based on Table 3, the e-worksheet being developed is declared valid from a media perspective if it meets the minimum have a good criterion.

Analysis of the practicality of e-worksheet in this research was carried out through evaluation of a questionnaire responding to the use of e-worksheet which was delivered to students. The data from the questionnaire was then analyzed using a Likert scale. First, data from student response questionnaires is tabulated by adjusting the scores (5) Strongly Agree (SS), (4) Agree (S), (3) Neutral (KS), (2) Disagree (TS) and (1) Strongly Disagree (STS). Next, the average of the collected data is calculated using the following formula:

$$\bar{y} = \frac{\sum_{i=1}^{n} y_i}{n} \quad \text{(ii)}$$

Information:
$\bar{y}$: average e-worksheet assessment score based on student responses
y_i : indicator statement scores to *i*, where i = 1, 2, 3, ..., *n*
n : number of assessment items

From the results of calculating the average e-worksheet assessment based on student responses, it is then matched to the interval class and criteria in calculating the practicality assessment classification. After that, an assessment classification is given based on the results of the assessment, which is then used to determine the practical value by referring to table 4.

Table 4. Classification of Practicality Criteria

No.	Score	Criteria
1	$\bar{y} > y_i + 1{,}8Sb_i$	Very good
2	$y_i + 0{,}6Sb_i < \bar{y} \leq y_i + 1{,}8Sb_i$	Good
3	$y_i - 0{,}6Sb_i < \bar{y} \leq y_i + 0{,}6Sb_i$	Enough
4	$y_i - 1{,}8Sb_i < \bar{y} \leq y_i - 0{,}6Sb_i$	Not enough
5	$\bar{y} \leq y_i - 1{,}8Sb_i$	Very less

(Widoyoko, 2019)

Based on the practicality classification in Table 4, to calculate the number of respondents' scores on the student respondent questionnaire using a Likert scale and the classification is as follows:
(1) Lowest Score = 1
(2) Highest Score = 5
(3) Ideal Maximum Score = $22 \times 5 = 110$
(4) Skor Minimum Ideal = $22 \times 1 = 22$
(5) Ideal Rate = $y_i = \frac{1}{2} \times (110 + 22) = \frac{1}{2} \times 132 = 66$
(6) Ideal Standard Deviation = $Sb_i = \frac{1}{6} \times (110 - 22) = \frac{1}{6} \times 88 = 14{,}67$

From these calculations, a practical range was obtained based on the student questionnaire responses as in Table 5.

Table 5. Classification of Practicality Criteria

No.	Score	Criteria
1	$\bar{y} > 92{,}41$	Very good
2	$74{,}80 < \bar{y} \leq 92{,}41$	Good
3	$57{,}20 < \bar{y} \leq 74{,}80$	Enough
4	$39{,}59 < \bar{y} \leq 57{,}20$	Not enough
5	$\bar{y} \leq 39{,}59$	Very less

(Widoyoko, 2019)

Based on the practicality classification in Table 5, the developed e-worksheet is declared practical if it meets the minimum have a good criteria.

RESULTS AND DISCUSSION

The results of this research describe the stages of e-worksheet development using a model *ADDIE* (*Analyze, Design, Development, Implementation,* and *Evaluation*). The description of the e-worksheet development stages is as follows: (1) Level analysis (Analyze) At this stage, researchers analyze the curriculum and materials, situations and conditions, and student characteristics. The stages of the analysis are described as curriculum and material analysis. The researcher conducted an analysis of the curriculum implemented at Junior High School Muhammadiyah 1 Pundong as a guideline for developing system of linear equations in two variables learning tools based on the 2013 Curriculum guidelines. Next, the researcher examined the system of linear equations in two variables material in the 2013 Curriculum. Based on the 2013 Curriculum, the Core Competencies (KI) of knowledge and skills are in the table following. Next, the researcher conducted interviews with mathematics teachers regarding the implementation of the curriculum used in schools on system of linear equations in two variables material. Based on the results of interviews, the results obtained were that the delivery of system of linear equations in two variables material at Junior High School Muhammadiyah 1 Pundong included modeling everyday problems with mathematical sentences to solving problems related to contextual problems. Core competence and basic competence in the 2013 revised 2018 Curriculum are implemented in system of linear equations in two variables at Junior High School Muhammadiyah 1 Pundong with a time allocation of 5×40 minutes per week with three meetings. Of the three meetings per week, system of linear equations in two variables material is taught at Junior High School Muhammadiyah 1 Pundong in six meetings (6×40 minutes). With the time allocated for six meetings with the content of basic competence coverage on system of linear equations in two variables material in learning, it creates problems for students, especially slow learner students which has limitations in solving system of linear equations in two variables problems.

Find out the situation and conditions in system of linear equations in two variables learning, researchers conducted observations and interviews regarding the learning models and teaching materials used by mathematics teachers. The results of the interview show that the teacher conducts learning by direct lectures conveying formulas without any guidance involving students in their learning so that slow learner students experience difficulty in solving contextual problems. In addition, researchers observed the teaching materials used by mathematics teachers during learning. From the results of observations made by researchers, the teaching materials used by teachers are worksheet prepared by the District MGMP Team. The worksheet contains a summary of the material, example questions, practice competency questions, mid-semester assessment practice questions and end-semester assessment practice questions, so that slow learner students have difficulty understanding the system of linear equations in two variables material. Especially a year ago during the pandemic, where the frequency of direct face-to-face contact between students and teachers was not optimal, even though the basis for studying system of linear equations in two variables, students had to understand linear equations with one variable in class VII material, resulting in students increasingly not understanding the material presented by the teacher, especially the slow learner students. However, the pandemic has had an impact on students' ability to use or operate cellphones/computers, even slow learner students open their cellphones more often than books and more students open their

cellphones not to study. However, in order to increase the enthusiasm for learning of slow learner students and not use cellphones to play, it is necessary to have Android-based electronic teaching materials. After communicating with the mathematics teacher, it is necessary to have electronic teaching materials for learning mathematics. According to the mathematics teacher himself, technology is very important in learning mathematics so that it can attract students' interest in learning and will also be more interactive. Based on the results of the observations and interviews above, the researcher developed the system of linear equations in two variables e-worksheet based on guided discovery learning with learning steps including providing stimulation, problem statement/identification, data collection, data processing. processing), verification, and drawing conclusions/generalizations.

Analysis of student characteristics, researchers conducted observations and interviews regarding students' initial knowledge related to system of linear equations in two variables material, and the difficulties faced by students. The results of these observations and interviews are to determine the thinking abilities of students who will become e-worksheet users. The results of these observations and interviews in the process of solving contextual problems, slow learner students still experience difficulties. Apart from that, in providing reasons for questions given by teachers, slow learner students are not yet able to provide logical reasons and conclusions in solving problems even though they have been given previous information. To determine the critical thinking abilities of slow learner students, researchers gave a written test which was used as an initial ability test which contained indicators of critical thinking abilities, including FRISCO (focus, reason, inference, situation, clarity, overview). The test results of slow learner students related to critical thinking skills are still low, as can be seen in Table 6 and Table 7.

Table 6. Initial Ability Test Results According to Critical Thinking

Question Items	Critical Thinking Indicators	Respondent						Average	Max Ideal
		1	2	3	4	5	6		
1	Focus	3	2	2	0	1	2	1,50	3
	Reason	0	0	0	0	0	0	0,00	9
	Inference	0	0	0	0	0	0	0,00	5
	Situation	0	0	0	0	0	0	0,00	3
	Clarity	0	0	0	0	0	0	0,00	5
	Overview	0	0	0	0	0	0	0,00	5
2	Focus	1	0	0	2	1	0	0,67	3
	Reason	0	0	0	0	0	0	0,00	9
	Inference	0	0	0	0	0	0	0,00	5
	Situation	0	0	0	0	0	0	0,00	3
	Clarity	0	0	0	0	0	0	0,00	5
	Overview	0	0	0	0	0	0	0,00	5
Total Score		4	2	2	2	2	2		
Score		6,7	3,3	3,3	3,3	3,3	3,3		

Table 7. Percentage of Initial Ability Test Results According to Critical Thinking

Critical Thinking Indicators	Rate-rate	Maks. Ideal	Percentage (%)
Focus	2,17	6	36.17
Reason	0,00	18	0,00
Inference	0,00	10	0,00
Situation	0,00	6	0,00
Clarity	0,00	10	0,00
Overview	0,00	10	0,00

Based on Table 7, it can be seen that the percentage of critical thinking ability test results is still very low. Apart from the results obtained, the researcher also conducted interviews with slow learner students who showed that slow learner students wanted more coherent learning with clearer steps starting from problems, giving reasons, linking material with previous material, classifying results, reviewing and concluding. on problem solving. Apart from that, students also said that they needed teaching materials that could guide them to more easily solve contextual problems related to system of linear equations in two variables so that with critical thinking skills they could understand the material they were studying. Based on the various analyzes above, researchers developed system of linear equations in two variables e-worksheet based on guided discovery learning to improve the critical thinking skills of slow learner students.

At the design stage, researchers developed an e-worksheet based on the guided discovery learning model for slow learner class VIII students. The material focused on system of linear equations in two variables and incorporated steps and indicators of critical thinking abilities. The system of linear equations in two variables material linked solutions to contextual problems, which were translated into Grade Point Average (GPA) and learning objectives. The e-worksheet design included guided discovery learning syntax: stimulation, problem statement, data collection, processing, verification, and conclusions. Critical thinking indicators followed the FRISCO model (focus, reason, inference, situation, clarity, overview). The design included instruments for initial ability tests and lesson plans, validated by experts on May 11 and 12, 2023. The expert validation showed that the material was suitable for the intended purpose. Meanwhile, input and suggestions are presented on the instrument review sheet, which can be seen in Table 8.

Table 8. Input and Suggestions from Material Expert Instrument Validators

No	Validator	Comments and Suggestions	Information
1	Master of Mathematics Education Lecturer	Adapt to suggestions, especially instructions related to critical thinking skills and compliance with GDL syntax	Feasible (can be used with revision)
2	Mathematics teacher at SMA Muhammadiyah 3 Yogyakarta	Student worksheets are good. But don't just leave everything empty in your activities. It would be better because it is used for Slow Learners students, in activity 1 (beginning) they are given a trigger with a coherent solution so that students are able to understand and will increase their enthusiasm to want to learn mathematics, especially at system of linear equations in two variables.	Feasible (can be used with revision)

The preparation of media expert validation instruments is referring to the preparation of teaching materials, which contains aspects of appropriateness of content, presentation and wisdom. Next, the media expert validation instrument was validated by experts, namely a mathematics learning evaluation lecturer (Master of Mathematics Education Lecturer at Ahmad Dahlan University) on May 11 2023 and a mathematics teacher (Math Teacher at Senior High School Muhammadiyah 3 Yogyakarta) on May 12 2023. Instrument validation results shows that the media expert validation instrument is suitable for use as a product validation instrument from a media perspective. Meanwhile, input and suggestions are presented on the instrument review sheet, which can be seen in Table 9.

Table 9. Input and Suggestions from Media Expert Instrument Validators

No	Validator	Comments and Suggestions	Information
1	Master of Mathematics Education Lecturer	The object layout needs to be improved, and the cover needs to be adapted to the system of linear equations in two variables material	Feasible (can be used with revision)
2	Mathematics teacher at SMA Muhammadiyah 3 Yogyakarta	Student worksheet good. However, the layout of the sentences in the box needs to be improved so that they can be read clearly. Apart from that, the student worksheets need to be given pages to make it easier for students to learn.	Feasible (can be used with revision)

The preparation of student response questionnaires includes suitability for language, interest, content, ease of use of media, graphics and benefits. Furthermore, the student response questionnaire instrument was validated by an expert, namely one of the lecturers in the mathematics learning evaluation course (Mathematics Education Magister Lecturer) on May 2, 2023. The results of the instrument validation showed that the student response questionnaire instrument was suitable for use as a student response questionnaire instrument. Meanwhile, input and suggestions from experts on the instrument review sheet can be seen in Table 10.

Table 10. Input and suggestions from Student Response Questionnaire

No	Validator	Comments and Suggestions	Information
1	Master of Mathematics Education Lecturer	Match student responses with indicators of critical thinking and the availability of model syntax *discovery learning*	Feasible (can be used with revision)

The preparation of students' initial ability test question instruments refers to indicators of students' critical thinking. By referring to indicators of students' critical thinking abilities, instruments for students' initial ability test questions were prepared. At the development stage, the researcher developed an e-worksheet which was created using Microsoft Word 2010, after which it was saved in a document in PDF format. Next, the researcher used the FaPa FlipBook Extender application so that the student worksheets file became e-worksheet. E-worksheet was developed by adding additional features that make e-worksheet more interactive so that researchers use the FAPA book extender application given by Mrs. Dr. Andriyani, M.Si as a form of expanding the functions of Flip PDF Corporate Edition on Android devices. Furthermore, e-worksheets which have been developed into an application can be accessed online and offline. So that the e-worksheet application can be validated by material experts and media experts. The validation results can be presented in Table 11.

Table 11. Implementation of E-Worksheet Product Trials

Meeting	Day, Time	Activity
1	Wednesday, 17 May 2023 12.30-14.30	The activities of the first meeting on e-worksheet implementation activities included: Explanation of the purpose of this activity, Giving students initial ability test questions slow learner, and Collection of initial ability test answer results
2	Monday, 23 May 2023 12.30-14.30	The activities of the 2nd meeting on e-worksheet implementation activities include Introducing e-worksheet, sharing link downloads related to e-worksheet and shows how to use it, Help and accompany students in opening link and download e-worksheet, Students do activity 1 and send their answers via WhatsApp (WA), and Evaluate the results of student completion and this activity
3	Tuesday, 24 May 2023 12.30-14.30	The activities of the 3rd meeting on e-worksheet implementation activities include Students' complete activity 2 on e-worksheet, Collection of settlement proceeds through WA, Evaluate the results of student completion and this activity, The teacher distributes student response questionnaires to the E-Worksheet used then students fill them in according to the existing instrument instructions, and Collecting student response questionnaire results

Furthermore, from the collection of student response questionnaire results to e-worksheet based on guided discovery learning, researchers calculated the total score of student responses to determine the practicality of e-worksheet, with the following results and shown in Table 12.

Table 12. Criteria of the Respondent

No	Respondent	Score Total	Criteria
1	Student 1	90	Good
2	Student 2	82	Good
3	Student 3	86	Good
4	Student 4	79	Good
5	Student 5	86	Good
6	Student 6	82	Good
Average		84.17	**Good**

In Table 12, it can be seen that the score from student 1 is 90 with good criteria, the total score from expert student 2 is 82 with good criteria, the total score from expert student 3 is 86 with good criteria, the total score from expert student 4 is 79 with good criteria, the total score of student expert 5 is 86 with good criteria, the total score of student expert 6 is 82 with good criteria and the average student response result is 84.17 with good criteria, it can be concluded that based on the student response questionnaire to e-worksheets is declared valid. So, it can be concluded that e-worksheets based on guided discovery learning is practical to use.

The learning process was carried out at Junior High School Muhammadiyah 1 Pundong for slow learner class VIII students with system of linear equations in two variables material. The learning process is carried out using learning steps/syntax with the guided discovery learning model. The first syntax of guided discovery learning step is stimulus (providing stimulation), students are given contextual problems. Students are directed to understand the problem. Second step problem statement, after observing and understanding the contextual problem, students are expected to be able to write a statement/problem based on the problem. Third step data collection, in this step students collect data and information that can be used to solve contextual problems. Fourth step data processing, in this step students process data based on the information and data obtained to solve contextual problems. Fifth step verification (proof), in this step students re-examine the correctness of their answers in data processing activities, then students write the results of their examination on paper, then students send their answers to the e-worksheet by taking a picture/photograph in the box provided. Sixth step generalization (drawing conclusions/generalizations), the final step in learning activities with models guided discovery learning. In this step, students draw conclusions based on the contextual problems given. Next, to solve the problem, students look for existing information or data, then collect data, process the data and prove the truth of the data processing process so that students can make conclusions to solve the contextual problem.

At the evaluation stage, researchers identify deficiencies in the e-worksheet implementation process and make improvements. This is done so that the e-worksheet implemented is better and suitable for use in the learning process. In evaluating the development of e-worksheets, researchers evaluated the results of all research stages down to aspects of validity and practicality. The evaluation stage in this development begins with the analyze stage, namely an evaluation related to the implementation of the 2013 curriculum and learning materials at Junior High School Muhammadiyah 1 Pundong and obtained class VIII system of linear equations in two variables material. Then an evaluation of the situation and conditions in the learning process, namely

regarding the teaching materials and learning models used during the process. So far, learning in class is still by means of lectures and using student worksheets teaching materials made by the District MGMP Team, not yet utilizing existing technology such as cellphones/Androids, where during the pandemic, students have often used them, but now cellphones/Androids are mostly used to play without learning, so that students cannot understand the material well and it does not increase students' enthusiasm for learning, including slow learner students whose level of understanding is low, therefore researchers choose e-worksheet teaching materials with the guided discovery learning model for slow learner students.

To evaluate the material and media in the student worksheets, researchers need to develop validation instruments, including material expert validation instruments, media expert instruments and student response questionnaire instruments related to e-worksheet development. Apart from that, the researcher prepared an instrument to test the initial abilities of slow learner students to determine the students' critical thinking abilities. After the preparation of the instrument is complete, the next evaluation related to product development. To evaluate the product being developed, researchers need expert validators, namely material experts and media experts. And it can be concluded that e-worksheets in terms of material and media is declared valid so that it can be used at the implementation stage.

The final stage of evaluation is evaluation at the implementation stage of the product developed by the researcher. At this implementation stage, researchers carry out trials related to the product being developed. Product trials were carried out over three meetings. Based on the results of development using the ADDIE model, it was obtained to produce e-worksheet that meets valid criteria both in terms of the material presented and in terms of media. The validity of the material expert is reviewed in terms of appropriateness of content, language, presentation, guided discovery learning approach, while the validity of the media expert is reviewed in terms of the use of fonts, layout, and e-worksheet design. Students' lack of ability to solve contextual problems can be helped by the stages of problem solving contained in the e-worksheet, starting from making mathematical models, making solution steps, determining the right formula and solving problems to making conclusions. This result confirmed the previous study conducted by Setyawan & Firdaus (2023). On the first day of implementing e-worksheet based on guided discovery learning, researchers conducted an initial ability test for slow learner students. The initial ability test results for slow learner students are still low, and there are even some students who solve the problem incorrectly.

CONCLUSION

The process of creating e-worksheet involves several stages. The first stage is the needs analysis stage, where an analysis of the curriculum and materials, situation and conditions, and characteristics of students is carried out. Next in the design stage, e-worksheets are created based on the results of the needs analysis, using the guided discovery learning approach. Aims to improve students' critical thinking skills, especially slow learner students, as well as to create validation instruments involving material experts, media experts, and student response questionnaires. Overall, the e-worksheet developed shows a category that is suitable for use. This can be seen from the material aspect which obtained an average score of 106.5 with good criteria and was declared valid. Likewise, in terms of assessment by media experts, they gave an average score of 41.5 with good criteria and were declared valid. Apart from that, e-worksheet

based on guided discovery learning has also proven to be practical, which can be seen from the results of students' responses to its use. The average student response reached 84.17 with good criteria, indicating that e-worksheet is practical to use in the learning process.

DECLARATION

Author Contribution

All authors contribute in the research process, such as collecting the data, analyzing the data, and writing the manuscript. All authors approved the final manuscript.

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Conflict of Interest

Both authors declare that they have no competing interests.

Ethics Declaration

We as authors acknowledge that this work has been written based on ethical research that conforms with the regulations of our institutions and that we have obtained permission from the relevant institutes when collecting data. We support the International Journal on Emerging Mathematics Education (IJEME) in maintaining high standards of personal conduct, practicing honesty in all our professional practices and endeavors.

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