

DEVELOPMENT OF STUDENT WORKSHEET ON MATERIALS ECONOMY BASED PROBLEM SOLVING

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ABSTRACT

This research aimed to determine the validity, practicalities, and effectiveness development of student worksheet on materials economy based on problem solving for Junior High School students Yayasan Pendidikan Islam (YPI) Tunas Bangsa Palembang. This research was developed consisting of four stages; define, design, develop, and disseminate known as 4D development models. The instruments were the validation sheet, questionnaire, observation sheet, and test sheet. The research and development data consisted of the qualitative and quantitative data. The qualitative data in the form of learning support facility, readability from the draft of student worksheet with problem-based instructions that were developed, and students' response against using student worksheet with problem-based instructions. While the quantitative data was in the form of test results of student learning. Based on the results of this research, it concludes that the student developed worksheet with problem-based instruction is valid, practical, and effective, so it is very well used by the teacher as a supplement in teaching to complement the teaching materials in the learning process.

Keywords: *student worksheet, economy materials, problem solving*

INTRODUCTION

The student worksheet is a guide for students in which the worksheets are used to conduct an inquiry or problem-solving activities. It can be a guide for cognitive aspect development exercises as well as guidelines for the development of all aspects of learning in the form of experimental or demonstration guidelines (Trianto, 2008). According to Departemen Pendidikan Nasional (2004), student worksheet is a sheet that contains tasks that must be done by learners. Student worksheet contains instructions and steps to complete a task that is assigned to students that can be either theory of practice. Its structure generally includes the cover page, manual of student worksheet usage, competence to be achieved, indicators, learning objectives, problems and answer sheets, answer key, and bibliography. It is one of the means to assist and simplify the learning activities so that it will form the effective interaction between students and teacher and can increase student activity in improving learning outcomes. In the school shows that integrated science students worksheet has still very minimal elements to be presented so that students are less interested in using it in the learning process. The teacher gives the worksheet to the students only when doing the activity and the used worksheet does not fulfill the elements that have explained before (Rahayu et al., 2017).

The 2013 curriculum emphasizes a contextual approach that becomes the process approach as the strengthening of scientific approach use. The scientific approach is one of the approaches that facilitate students to acquire knowledge and skills based on a scientific method that is observing, questioning, reasoning, trying, and forming networks (concluding, presenting, and communicating). Students are directed to process knowledge, discover, and develop their own concepts with regards to the subject matter so that it provides an opportunity for students to cultivate the high-level thinking

skills (Kementerian Pendidikan dan Kebudayaan, 2013). One of the appropriate approaches is the scientific approach with 'what if not' strategy. To develop the ability of problems posing, it can use a 'what if not' strategy by changing the data in question, adding data on the problem, changing the data with the same questions, or changing the questions with the same data on the problem. Based on the observations and interviews conducted to teachers at those three schools, it can be concluded that the worksheets need to be developed through a scientific approach with 'what if not' strategy to improve the students ability in school (Putra, Herman, & Sumarmo, 2017). However, the reality in the field shows that student worksheet circulating at this time only contains exercise questions for the student to do. It turns out that the students' used worksheets in the field tend to contain information which is very short and less guide for the students to be more understand the material thoroughly.

Theoretically, student worksheet is included in learning media. Therefore, the student worksheet to be used should optimize student learning outcomes. Based on the observations of researchers derived from observation and resources discussion directly to teachers of the economic subject in SMP YPI Tunas Bangsa Palembang, the students still do not understand the concept of the materials identified by the teacher that just referred to the distributed guidelines by the school. The teacher should give notes to students in the blackboard or the thickness, so it takes much time in delivering the subject matter. In this way, the time to work on the problem becomes less. This has an impact on student learning outcomes obtained. There are 49% of students whose value has not achieved the Minimum Exhaustiveness Criteria or KKM that has been established in the school. The conformed KKM is 75.

In order to carry out the learning activity which can increase students critical thinking ability, it absolutely needs the development of teaching materials that can be used to improve the quality process and learning outcomes, as well as the development of teaching materials in the form of student worksheet based on problem-solving. The student worksheet is expected to facilitate the students to learn independently and critical analysis (Fitrayati, Prakoso, & Dewi, 2016). According to Utami et al. (2016), the result shows that learning geography by using a worksheet gets a very good response from the learners. This shows the active learners to express the opinion, ask questions, and discussion in the group. Data, images, and maps in the worksheet also attract the attention of learners in learning. Facts obtained in the field, it turns out that the school for this period, 2017/2018, does not use student worksheet that is purchased from the publisher as in previous years. It is because the principal has instructed each teacher of the field of study to make their own student worksheet tailored to materials to be taught as well as the level of needs of students. However due to the fact that one of the teachers in the field of economics is not ready to develop the student worksheet, and this is the reason why the students still use manuals that are distributed by the school as the only source of learning in the classroom. For IPS (social science) books that are distributed to the students, it is not accepted by every student in the class, but two students who are sitting in a table share one book and take turns. The curriculum used in the school is still using Kurikulum Tingkat Satuan Pendidikan (KTSP), so the book used is still using the KTSP reference.

From the background of this problem, then the researchers are interested in developing student worksheet that is expected to play an important role in helping students in learning and teachers in teaching. It can direct the mindset of students and teachers in finding new knowledge that can involve awareness of it and the ability to solve problems to do and answer any problems presented in the student worksheet. The role of teachers as facilitators in the learning process is expected to be maximized because learning activities will become more focused and students can construct their knowledge independently.

METHODS

One model of research and development (R&D) in the field of education is proposed by the Gall, Gall, and Borg (2003). According to them, R & D in education is a process to develop and validate educational products. The stages include (1) research and information collection; (2) planning; (3) preparation of product design; (4) initial or limited trial; (5) revision of the main product; (6) large-scale trials; (7) operational product revisions; (8) field trials; (9) revised final product and (10) dissemination. Thiagarajan, Semmel, and Semmel (1974) summarize four main stages there are define, design, develop, and disseminate known as the 4D model. The relationship between 4D model and the R & D stages is shown in Table 1.

Table 1 Relationship between 4D Models (1974) and R&D (2003)

No	The 4D Model of Thiagarajan, Semmel, and Semmel (1974)	R & D from Gall, Gall, and Borg (2003)
1	Define	Information gathering and planning
2	Design	Product design
3	Develop	Initial test, major product revisions, broad-scale trials, product operational revisions, field trials, and final product revisions
4	Disseminate	Socialization of implementation

The activities in this development research becomes a large-scale trial or implementation. The design of the study is presented in Figure 1.

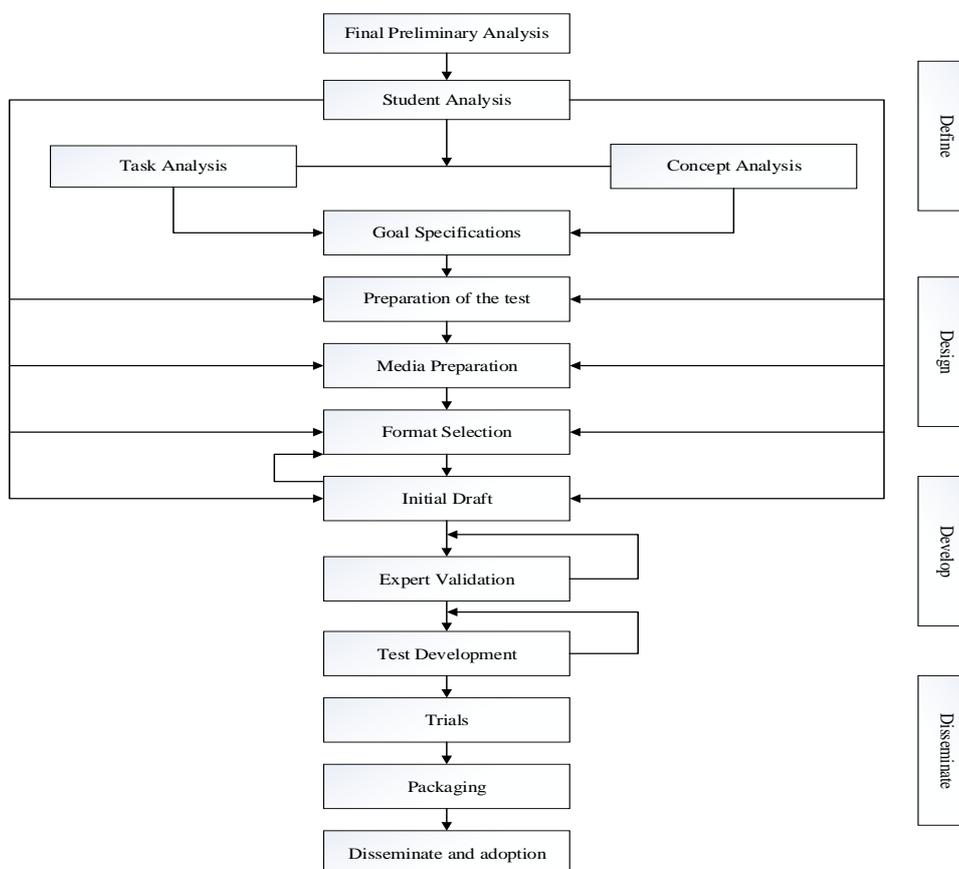


Figure 1 Development of Design Flow Model 4D

Research procedures and development of student worksheet with problem-based instructions consist of; (1) needs analysis (Define) is the initial research phase in research and development. The collection of various information is done through literature studies and field studies. The literature study is about materials for product design. Field studies collect learning support factors including books, instructional media, and instructional techniques conducted by subject teachers. (2) Designing of student worksheet with problem-based instructions (Design), the result of the study literature and the field will be used as the material for the initial product design (draft) student worksheet with problem-based instruction. This draft designed should consider the feasibility of implementation in the field. (3) Development of student worksheet with problem-based instruction (Develop) consists of; first is expert validation that is the draft of student worksheet with problem-based instructions will be validated by experts' review that have expertise in the field of material, language, and design. Expert input will be used to enhance student worksheet draft with problem-based on instructions develop. Second, limited trials and product revisions are the limited trials that will be conducted in class IX.1 at SMP YPI Tunas Bangsa Palembang. The study design used in this limited trial is by giving of a test in the form of a practice that is loaded in one of the student worksheets that has been designed. Third, large-scale trial and product revisions, is student worksheet with problem-based instructions will then be tested on a large scale or implementation. This trial is conducted in class IX.2 at SMP YPI Tunas Bangsa Palembang. The end product of this development in the form of student worksheet with the problem-based instruction has proven that it can be used by teacher and students as a support in the learning process. Table 2 summarizes the relationship between the required data source and the research to be used in the research instrument.

Table 2 Relationship between Required Data, Data Sources, and Research Instruments

Activities	Necessary Data	Data Source	Research Instrumens
Field studies	Learning support facility	Teacher	Questionnaire
Expert Validation	Readability of the draft with the student worksheet developed problem-based instructions	Expert Team (expert review)	Format expert judgment
Limited Trial	Development effectiveness data worksheet for student with problem based instructions	Classroom learning process	Guidelines for observation and test of learning outcomes
	Students response against with use worksheet	Student	Questionnaire
Large Scale Trial	Data effectiveness of using student worksheet with problem based instructions	Teaching and learning process	Guidelines observation and test results learning

The research and development data consist of the qualitative and quantitative data. The qualitative data in the form of learning support facility, readability from the draft of student worksheet with problem-based instructions that are developed, and students' response using of student worksheet with problem-based instructions. While the quantitative data are in the form of test results of student learning.

RESULTS AND DISCUSSIONS

The analysis reviews the experts to collect data related to instruments that have been developed in the form of student worksheet with problem-based instructions. Expert evaluation is done by experts in the field of study. Some experts use the evaluation sheet devoted to material and language specialists and experts to design student worksheet with problem-based instructions. The

opinions of these experts are collected using questionnaires that contain the questions that should be answered in two ways; firstly by choosing among the five options consisting of the less good, the less good, good enough, good and excellent. Table 3 shows the validation results by material and language experts.

Table 3 Validation Results by Material and Language Experts

No	Indicator	Assessment Item	Average Value
1	Assessment of design student worksheet with problem based instructions on teaching materials	Competency standards Basic competency Learning objectives Summary topic	81,00%
2	Assessment of material translation of the design student worksheet with problem based instructions on teaching materials	The material on LKS (students worksheet) has been explored, so it is easily understood by students Establish competency standards, titles, and learning objectives (basic competencies to be achieved) Formulate basic competencies to be achieved Choosing and describing the learning materials based on core competencies which want to reach Make indicators the achievement of basic competencies Orients students on issues Organize students to learn Conduct individual and group investigations Develop and present the work Analyze and evaluate the problem solving process	80,50%
3	Assessment of language use and illustration of design student worksheet	Easy to understand by students Encourage students to read a summary of the material that has been provided Using the good and correct Indonesian language Using clear and simple sentences	79,50%
Average			80,33%

Table 3 shows that values matter and language expert validation is 80,33% which means that the worksheet for students with problem-based instructions worthy of use in the field, but with some revisions. The average percentage of material experts on the draft assessment student worksheet with problem-based instructions on teaching materials is 81,00%, it means that the initial draft for the student with problem-based spreadsheet instructions suffices. The average percentage of the material expert of translation rating material against the draft student worksheet with problem-based instructions on teaching materials is 80,5% that means the translation of the material to the student worksheet with problem-based instructions included in both categories. Moreover, the average percentage of the rate using language and illustrations against draft the student worksheet is 79,5% that means that the student can be understood using the worksheet. The average overall of validation material and language expert at 80,33% means that the student worksheet with problem-based instructions is included in the category appropriate to use although some revisions. The feedback and suggestions for improvement are the corrective and straightforward improvement. The revised expert input is listed in Table 4.

Table 4 Revised Appraisal Lists of Material and Language Experts

Part	Before Revision	After Revision
Task Sheet	Problems are made in the form of short description questions	Problems are made in the form of case questions
Instructional Work Insctuctions	Created briefly	Made more clear instructions on the problem

While the validation by design experts obtain the results as in Table 5.

Table 5 Result of Validation Expert Design Student Worksheet with Problem-Based Instructions

No	Indicator	Assessment Item	Average Value
1	Conformity approach	Student worksheet has been prepared based on guidelines for the student worksheet. The main topic of discussion in each chapter is relevant to the curriculum that is used in school. Student worksheet has been presenting the material in accordance with the purpose of learning.	82,50%
2	Effectiveness and efficiency of achievement competency	Student worksheet has provided ease of learning material presentation as summarized such that students easily understand the material. The preparation of student worksheet can motivate students to learn.	85,00%
3	Compliance with the characteristics of the target (audience)	The preparation of student worksheet is according to the characteristics of students. Student worksheet are compiled using text and illustrations that match the characteristics of students.	83,80%
4	Compliance of evaluation with indicator of competency	Comprehension test assignment sheet is relevant to the material covered. Comprehension test assignment sheet is easily understood by students. The preparation of student worksheet comprehension test assignment uses clear and simple sentences.	84,00%
Average			83,82%

The average value of design experts is 83,82% which is the category with the student worksheet instructions problem based fit for use in the field with the revision. The result of the validation questionnaire by design experts obtain results; (1) compliance approach 82,50% means that the student worksheet has been prepared based on guidelines for the preparation of worksheet, the principal of discussion in each chapter relevant to the curriculum used in the school, and it has presented the material in accordance with the purpose of learning and can be categorized as good. (2) Effectiveness and efficiency of achievement competence 85,00% mean that the worksheet for students with problem-based instructions has given the ease in presenting the material learning as summarized such that students easily understand the material so that it can motivate students to learn and categorized as good. (3) Compliance with the characteristics of the target (audience) 83,80% means that the worksheet for the student with problem-based instructions has been prepared in accordance with the characteristics of the student. (4) Compliance evaluation with indicators of the competence of 84,00% means an assignment sheet and comprehension test that has been prepared in accordance with the material discussed so that it is categorized both for use. The average result of the design expert

score is 83,82% in the appropriate category to be used in accordance with the revision or advice of the expert. Input from the design experts such as the improvement of learning indicators on the order of components student worksheet should not be made in one indicator for two operational verbs. The layout of the student worksheet should be consistent in each chapter, and the presentation of the material is made even more interesting.

In addition to a review of some experts, a questionnaire is also distributed to evaluate the response of the students on the use of student worksheet with problem-based instructions. The purpose of this questionnaire is to evaluate the response of the students after using it for further improvement. It can be seen in Table 6.

Table 6 Results of Student Questionnaire Response after Using Student Worksheet with Problem Based Instructions

No	Assessment Item	Percentage	Average
1	Do you enjoy learning by using LKS during the process of economic learning in the classroom?	85%	80,70%
2	Is LKS problem based instructions easy to use?	80%	
3	How do you follow the interest of learning economy by using LKS with problem based instructions?	80%	
4	Do the LKS instructions with problem based instructions attract you?	78%	
5	How do you interpret the translation to shine in LKS with problem based instructions?	78%	
6	How is your understanding of the questions given?	80%	
7	How would you think if the materials in social studies economics are given using LKS with problem based instructions?	80%	
8	How is your response if other subjects given by using LKS with problem based instructions?	80%	
9	How do you comment on the view of LKS with problem based instructions are provided?	84%	
10	What are your thoughts on the use of navigation or guidance that are used in the LKS with problem based instructions?	82%	

Note: LKS stands for Lembar Kerja Siswa

The student worksheet is the good use of problem-based instructions on the economic subject at YPI Tunas Bangsa Junior High School students in Palembang, but it still needs to hold revisions. Evaluation at this stage involves all the student worksheet with problem-based instructions totaling 45 students. Efforts are made to see what students' thoughts about the student worksheet with problem-based instructions that have been developed. It can be seen in Table 7.

Table 7 Results of Student Questionnaire after Using Student Worksheet with Problem-Based Test Instructions in Actual Classroom

No	Assessment Item	Percentage	Average
1	Do you enjoy learning by using LKS during the process of economic learning in the classroom?	85%	81,10%
2	Is LKS problem based instructions easy to use?	80%	
3	How do you follow the interest of learning economy by using LKS with problem based instructions?	84%	3
4	Do the LKS instructions with problem based instructions attract you?	80%	4
5	How do you interpret the translation to shine in LKS with problem based instructions?	78%	5
6	How is your understanding of the questions given?	80%	6

Table 7 Results of Student Questionnaire after
Using Student Worksheet with Problem-Based Test Instructions in Actual Classroom (Continued)

No	Assessment Item	Percentage	Average
7	How would you think if the materials in social studies economics are given using LKS with problem based instructions?	80%	
8	How is your response if other subjects given by using LKS with problem based instructions?	80%	
9	How do you comment on the view of LKS with problem based instructions are provided?	80%	
10	What are your thoughts on the use of navigation or guidance that are used in the LKS with problem based instructions?	82%	

The results of calculations can be seen that the response of students in the student worksheet with problem-based instructions amounted to 81,10% means that students enjoy learning using the student worksheet with problem-based instructions. It can be concluded that the student worksheet with problem-based instructions used must be conveyed. The economics is learning in school, and the teacher usually uses the worksheet as a companion textbook in delivering materials to students in the class. However, the worksheet used is a worksheet issued by the publisher so that the value achieved by a new student part of who achieve mastery. This happens because the material described by the teacher is sometimes different from the questions matter.

Table 8 Summary of Learning Outcomes
After Learning Using Student Worksheet with Problem Based Instructions.

The number of students	No Question	Score Average	Information
45 students	1	80 %	Complete
	2	90 %	Complete
	3	75 %	Complete
	4	70 %	Incomplete
	5	80 %	Complete
	6	75 %	Complete
	7	70 %	Incomplete
	8	80 %	Complete
	9	85 %	Complete
	10	80 %	Complete

From the calculation of student scores in Table 8, it can be seen that the value average student learning outcomes after using the student worksheet with problem-based instructions are in the category above average minimum completeness have been set at the school. The results of this research indicate that the student worksheet with problem-based instructions can enhance students understanding of the learning process in YPI Tunas Bangsa Junior High School Palembang.

According to previous research, the result shows that learning by using a worksheet gets a very good response from the learners. The main results of this research are conducted in YPI Tunas Bangsa Junior High School Palembang. Learning is done by using worksheet based problem solving that has been developed. The student response is seen from the clarity of the student worksheet that is also supported by positive comments when they are asked at the end of the lesson. According to the students, they have said that learning to use this worksheets is easy to understand.

CONCLUSIONS

The results show that the value average validation expert and language material is 80,33%, average value validation of design experts is 83,82%, that means the worksheet for students with the problem-based instruction which is developed feasible for use in the field but with some revisions. Based on the results of a questionnaire distributed to students on a limited trial obtains the average of 80,07% students response meaningful student worksheet with problem-based instruction developed both used in the economic learning process but still needs to be revised. The results of field trials state that the student worksheet developed eligible for use with an average students response of 81,1%. Besides, students understanding of the material increases from below 70% average to above KKM (above 75%). This suggests that learning to use the students' worksheet developed can be understood by students. Based on the results of this research concludes that the student worksheet with problem-based instruction developed categorized valid, practical and effective, so it is very well used by the teacher as a companion in teaching to complement the teaching materials in the learning process.

Based on the results of research and discussion, it can be concluded that; (1) use of the student worksheet with problem-based instructions can enhance students understanding of the learning process of economic. (2) Students response after using the worksheet is excellent, and it supports the complement textbooks used in the learning process in school. (3) Validity level, practicalities, and effectiveness of student worksheet with problem-based instructions which have been developed are met. The research limitations in this research are the management of time in doing research data retrieval, so not many student worksheets that can be completed. Further research is expected that researchers are able to manage the time well so that data retrieval can be done optimally.

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