DEVELOPMENT OF MATHEMATICS STUDENT WORKSHEETS (LKPD) ASSISTED BY PUBLISHER 2016 MATERIAL ON A SYSTEM OF LINEAR EQUATIONS WITH THREE VARIABLES IN CLASS X SMK AL QODIRI JEMBER

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Abstract— **The formulation of the problem in this study is about how the process of developing student worksheets or mathematics LKPD assisted by Publisher 2016 material three-variable linear equation system using the 2013 curriculum in grade X of SMK Al Qodiri Jember and this research is limited to product validity tests only. The purpose of this research is to develop a product in the form of student worksheets or mathematics LKPD to be even better so that in the process of utilizing it can achieve the goals of learning itself. This research is a development research or Research & Development (R & D) using a 4D development research model in which there are four stages. The results showed that the total score of the three validators was 249.809% with an average of 83.269%. Thus the student worksheet or LKPD mathematics class X material system of three-variable linear equations is declared valid and can be used, but needs minor improvements or revisions.**

Keywords— Student worksheet, Publisher 2016, system of three-variable linear equations

I. INTRODUCTION

Mathematics is a field of science that studies patterns of structure, change and space.[1] Mathematics can be referred to as the science of numbers and numbers. In the formalist view, mathematics is the study of abstract structures defined using symbolic logic and notation. There is another view that mathematics is a basic science that underlies other sciences.[2] Mathematics is divided into three major parts: algebra, analysis, and geometry.[3]

In his study, mathematics is abstract where mathematics has many symbols and notations that can only be imagined in the mind. This is one of the reasons mathematics is a subject that is feared and not in demand by many students.[4] One of the materials from the algebra section that is taught and considered difficult in class X is the system of linear equations in which it discusses the system of three-variable linear equations (SPLTV).[5]

Success in the learning process, in addition to depending on the method and curriculum used is also very dependent on the learning tools used. One of the learning tools used is LKPD. According to Fahrie (2012) Student worksheets are sheets that are used as guidelines in learning and contain tasks that must be done by students in certain studies. According to Sudrajat (2009), student worksheets are sheets containing tasks that must be done by students.[6]

In this study, we strive to develop teaching materials in the form of Student Worksheets assisted by Publisher 2016 that can help teachers and students in facilitating the learning process and improving students' mathematical skills.

II. METHOD

A. Research Methodology

The type of research used in this study is Research and Development (R&D) or development research. This research focuses on designing or designing both in the form of teaching material design, teaching design models, teaching material products or learning media and also processes.[7]

This development research refers to the development research procedure according to Sugiyono which is tailored to the needs of researchers where this research uses research and development at level 1. Researchers conduct research to design products and conduct research to test the product design internally (expert and practitioner opinions).[8] So researchers use the R&D research model limited to validity tests only, namely tests conducted by mathematical content experts, design experts, and linguists.[9] Validation is carried out by material experts, media experts, and design experts using FGD (Focus Group Discussion) techniques and based on Expert Judgment.[10]

Through this research and development, researchers are trying to develop products in the form of teaching materials for student worksheets (LKPD) assisted by Publisher 2016 software.[11] This development research procedure is limited to only 5 steps, namely potential problems, data collection, product design, product validation, and product revision.[12]

III. RESULT AND DISCUSSION

Researchers conducted research in one of the schools in Jember, namely SMK Al Qodiri Jember.[13]

This research has produced teaching materials in the form of High School Mathematics Student Worksheets (LPKD) assisted by Publisher 2016 material on three-variable linear equation systems.[14]

To determine the level of validity of the teaching materials developed, researchers conducted validity tests conducted by three expert lecturers.[15] The validity analysis of LKPD was obtained based on the average of three

validators, namely mathematics content experts, design experts, and linguist lecturers.[16] The scores of each validator will be added up and then divided by the number of validators. Here is the validation data from the expert team.[17][18]

Table 2. Average Validation

Validator Name	Score	Validity Level
Mohammad Mukhlis, M. Pd	90%	Highly Valid
Masrurotullaily, M. Sc	83,809%	Valid
Dr. Khotibul Umam, M. A.	76%	Valid
Sum	249,809%	Valid
Average	83,269%	Valid

Based on the table data above, it can be seen that the number of scores from the three validators is 249.809% with an average of 83.269%. Thus the student worksheet or LKPD mathematics class X material system of three-variable linear equations is declared valid and can be used, but needs minor improvements or revisions. The initial design of the Student Worksheet (LKPD) teaching materials that has been developed consists of the front cover of the LKPD, preface, table of contents, concept map, basic competencies, work instructions, subject matter, competency test, bibliography, and back cover of LKPD.[19]
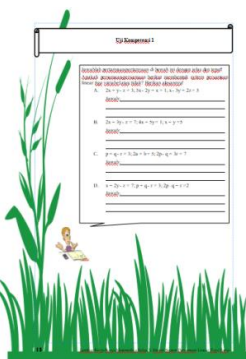

Figure 1. Student Worksheet Display

Figure 2. Student Worksheet Questions

Figure 3. Back Cover of Student Worksheet

IV. CONCLUSION

Based on the results of validity tests by mathematical content experts, the developed product gets a score of 90% with very valid criteria. Based on the results of validity tests by design experts, the developed products get a score of 83.809% with valid criteria. Based on the results of validity tests by linguists, the developed product gets a score of 76% with valid criteria. Of the three validators, the products developed in this study get a total score of 249.809% with an average score of 80.269% and can be categorized as valid, so that the resulting products can be used in the field but need minor improvements or revisions.

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