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Development of Chemical Instruments (Handout) Model of Findings Based On KAPRA Class X SMA / Ma

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Abstract:*This study aims to generate criteria of chemistry teaching materials based on KAPRA-based invention models that are suitable for use in learning. The teaching materials were developed using the Thiagarajan 4D model reference. This study uses only three development stages, namely define, design, and develop. Subjects in this study were 4 validators and 5 students of class X MA NW Selaparang. The data used in this study is the primary data from the validation questionnaire collection. Validation test result is 73,99% included into eligible criterion by validator, and 5 students also get criterion worth equal to 79.68%.*

Keywords: *Teaching materials, guided discovery, KAPRA, 4D model*

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I. Introduction

One's learning outcomes are influenced by several factors, one of which is the factor from outside the individual is the availability of teaching materials as a means of learning. Teaching materials are the information, tools and texts that teachers need for planning and reviewing the implementation of learning (Jumairi, 2015). Exposure to teaching materials should be able to trigger the curiosity of learners so that there is a process of constructing the concept of learning activities of the book (Carera dan dasna, 2012).

Another fact that is based on the results of initial observations of researchers disalah one school dikecamatan Kediri namely MA NW Selaparang that textbooks in use by teachers only in the form of LKS and in the form of chemistry textbooks in the library or buy in bookstores such as books LKS chemistry for SMA / MA class X and electronic school books (BSE). Overall the books still have some drawbacks in terms of appearance, simple content packed content, long reading editorials that make learners feel bored or bored when reading the books. Chemistry teacher in MA NW Selaparang also revealed that interest in reading the students is still very less because the chemistry books used are less interesting so that some students often difficult to understand the learning materials, this has an impact on the learning outcomes of learners. Another fact is also that the teacher has never developed a learning tool either teaching materials in the form of modules, handouts, LKS or other that support the learning process. Teaching materials as one learning tool and learning resources for learners should have an important role in the learning process to assist teachers in directing learning to run more optimally. One of them is by developing teaching materials that can be varied with the learning model.

The recommended learning models to be used in learning in the Curriculum 2013 are discovery / inquiry learning and problem / project based learning (PBL / PjBL) (Permendikbud No.22 of 2016). However, not all learning models can be applied to address the problems that occur, among many types of existing learning models the researcher chooses to apply the guided discovery learning model. Bruner (2006) in (Rijal, 2014) suggests that learners should learn by actively participating and making discoveries to gain experience allowing them to discover the concepts and principles themselves. This can be facilitated through guided discovery learning. Carin et al., (1989) in (Nuriyatin, 2016) also states that "guided discovery teaching provides opportunities for greater involvement, giving children more chance to gain insights and better develop their self-concepts". These guided discoveries provide learners with the opportunity to be directly involved in learning, and also provide more opportunities for learners to gain insight and better develop learners' self-concepts. This model can improve students' learning outcomes because they encourage learners to be directly involved in the learning process (Rostina, 2016). The learning process with this guided discovery model in improving learning outcomes can be integrated with KAPRA-based. According to Juan et al (2012) and Apriyani et al (2015) KAPRA is a learning step consisting of linking components, experiencing, reflecting (negotiating) meaning and affirming (Applying). The learning steps of the KAPRA will be integrated with the steps of the guided discovery learning model that are expected to facilitate the improvement of learners' learning outcomes. Therefore, the development of this instructional materials as a form of solution offered to solve problems in teaching and learning activities so that researchers conduct research with the title of development of chemistry

materials KAPRA based guided discovery model on the material of electrolyte solution and non-electrolyte solution. In short the purpose of this research is to produce criteria of chemistry teaching materials based on KAPRA-based appropriate invention model.

II. Research Methods

This research is research development (Research & Development / R & D). In this development research used 4D development model. The 4D model stands for Define, Design, Develop, Disseminate, developed by Thigarajan, Semmel, and Semmel 1974 (Kurniawati., 2013). In this research development is limited to define stage, design and develop and not until disseminate stage. Products developed by chemistry materials in the form of Handout. Determination of sample research conducted by using non-probability sampling.Where the target sample here MA NW schoolSelaparang class X semester 2 with the number of students 5 people. Data collection methods in this study using a validation questionnaire.

III. Result and Discussion

The following data obtained by the researchers consisting of the results data that is expert validation, and validation of legibility by learners.

Table 2. Validation Results from Validators

Validator	Content Presented	Presentation	Languge	Validation Results	Information
1	75%	75%	75%	75%	Valid
2	75%	75%	75%	75%	Valid
3	90%	83.33%	81.25%	84.86%	Very valid
4	62.5%	58.33%	62.5%	61.11%	Quite valid
Avarage	75.62%	72.91%	73.43%	73.99%	Valid

Validation tests are conducted in an attempt to produce good teaching materials that are relevant to the theoretical foundation of development (Hera, 2014). Assessment of validation by the expert or validator is very important so that it can be known weakness and strength of developed teaching materials (Sugiyono, 2012). Validation results by experts or validators of chemistry teaching materials based on KAPRA-based invention model to improve the critical thinking skills developed this response that has several different categories that is very feasible, feasible and decent enough. This is in accordance with the eligibility criteria applied by BSNP so it can be continued in school where the research. Furthermore, the components assessed from these chemistry materials are the feasibility of presentation, content and language components. However, when viewed from the average of each aspect in Table 2 shows the feasibility criteria that is feasible. In line with the research Kurniawati (2013) that the developed learning material gets the eligibility criteria from the validator, so that this developed material is worthy of use in learning. Although these developed materials are eligible criteria but there are still some shortcomings in the chemistry materials (handouts) that should be revised based on suggestions and insert from each validator one of them is design lacking (consistency, format, and appeal). Weaknesses contained in it will be fixed by completing the existing shortcomings, so that the presentation can be presented in full and supported by a display that attracts learners to read it. Thus, this has been the answer to the constraints faced by teachers and learners, namely the unavailability of interesting materials. Teaching materials validated by experts or validators, then tested valid legibility readiness by learners. This validation test is an individualized trial with five learners as an appraiser. The feasibility level of design and content of chemistry teaching materials based on KAPRA based innovation based on four components, namely the components of motivation, language, material and graphics.

Based on the results of individual trials it was found that chemistry teaching materials based on KAPRA based learning model got the criteria of "feasible" with a feasibility percentage of 79.68%, so that according to the five students the appropriate chemistry materials used in learning. This is in line with research Apriyani (2015) which states that developed learning material gets the appropriate criteria of learners so it can be used. The feasibility test is also very important as Widyaningsih (2013) argues that a feasibility assessment is essential to ensure that proper teaching materials are used in the learning process. Student's response to a feasibility of this chemical resource can be used as a reference in improving the chemistry of the material (handout).

IV. Conclusion

Based on the research that has been done, it can be concluded that: 1)Chemical teaching materials of KAPRA-based guided discovery models developed have average validity of 73.99% and meet criteria worthy in terms of content, linguistic components, presentation components, and content components, 2) Chemical

teaching materials of KAPRA-based guided discovery models developed are also considered appropriate by learners in terms of validation of legibility with an average value of 79.68%.

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