

## **The Development Of Chemistry Teaching Materials In The Form Of Handouts Based (PBL) In Class XI IPA Madrasah Aliyah (Ma) Kediri District**

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**Abstract :** *This study aims to produce chemistry-based learning materials model problem-based learning (PBL) that is feasible to use in the learning process. The research method used in this research is research and development (R & D) by following the 4-D development model according to Thigarajan, Semmel, and Semmel which is adapted from Muchayat covering four stages. However, this development research is limited to three stages: 1) Defining stage 2) Design stage 3) Development stage. Expert validation test results are 78.04% included into eligible criteria. Based on these results indicate that the learning materials based on problem-based learning (PBL) is feasible for use in students XI IPA MA.*

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### **I. Introduction**

The independence of learners in learning, especially in finding solutions to problems that occur in the classroom in the learning process is very less. So the low quality of chemistry learning process that resulted in low learning outcomes of learners. Chemistry includes chemical knowledge in the form of facts, theories, principles, and laws based on scientists' findings and scientific work. Therefore, in chemistry learning in high school teachers have to pack the presentation of material in order to help learners understand the material well (Kurniawati, 2013). The use of teaching materials is one of the media utilization in a learning process. The use of teaching materials in the learning process becomes an alternative teacher to make it easier in teaching materials to learners. The lack of availability of teaching materials becomes one of the impacts of teacher-centered learning processes, so learners do not have an independent learning culture. Packaging of teaching materials so far is still linear and has not presented teaching materials that hone the ability persta students. Teaching materials are information, tools and texts that teachers need for planning and reviewing learning implementation (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 and Dasna, 2012).

In addition to teaching materials to improve learning outcomes of learners, an innovation is needed to the learning process. Innovation can be done using several approaches, strategies, methods, and learning models. Learning model that can be used to create effective learning and many fun, one of them is by using Problem Based Learning (PBL) or problem based learning model (Surif, 2013). PBL is a constructivist learning strategy, centered on learners where learners work collaboratively to solve problems and reflect on their learning experiences to advance or gain new knowledge (Redzuan, 2016).

According to Adiga, 2015 that the preparation of appropriate PBL-based teaching materials is expected to optimize the learning outcomes of learners, 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 under the title development "Development of problem-based chemistry-based learning materials (PBL) on acid-base aqueous materials of class XI IPA". In short the purpose of this research is to produce criteria from the chemistry materials be basis PBL decent.

### **II. Research Methods**

The type of this research is This research type is research development (Research & Development / R & D). Research development is a research method used to produce a particular product, (Hermansyah, 2017). In this development research used 4D development model. The 4D model is an abbreviation of the definition, design, development and dissemination developed by Thigarajan, Semmel, and Semmel 1974 (Kurniawati, 2013). However, in this study only to the stage of development, because pengembangannya only done at the

school place under study alone. This research is focused on product development in the form of PBL-based chemical materials on acid-base material. Products developed by chemistry materials in the form of Handout.

### III. Result and Discussion

One of the steps included in the core step of development of teaching materials is the validation test. Expert validation is a process to assess the design of the product being developed in order to know the weaknesses and advantages of the developed product (winarso, 2017). Validation test aims to produce a standard teaching materials and feasible to use (gultom, 2017) .Validation is a process of activity to assess whether the design of the product, in this case the new teaching method rationally will be more effective than the old or not. Said rationally, because the validation here is still an assessment based on rational thinking, not field facts. Therefore, each expert is asked to assess the product, so it can be known weakness and strength (Sugiyono, 2017). The criteria used to evaluate the feasibility of learning materials of chemistry learning are adapted to the criteria of standard of assessment of teaching materials from National Education Standards Agency (BSNP) which outline three components, namely the assessment of content components, linguistic components and presentation components. Based on the validation result, teaching learning materials get the criterion "feasible" criterion with percentage value is 78,04.

The following results data validator:

No	Validator	Komponen yang dinilai			Rata-Rata	Kategori
		Isi	Penyajian	Bahasa		
1	Validator 1	84,1%	75%	87%	82,03%	Sangat layak
2	Validator 2	75%	75%	75%	75%	Layak
3	Validator 3	86,3%	79,1%	75%	80,13%	Sangat layak
4	Validator 4	75%	75%	75%	75%	Layak
<b>Rata-Rata</b>					<b>78,04%</b>	<b>Layak</b>

In line with the research Kurniawati (2013) and Nasir (2015) that the developed learning material gets the eligibility criteria from the validator, so that the developed material is worthy of use in learning. Based on the validation test of chemistry teaching materials (handout) based on PBL is considered feasible to be used by learners. Presentation model of material in accordance with the needs of learners (tailored to the results of define analysis) it is expected that the teaching materials handout can improve the knowledge and understanding of learners. A handout is usually a written learning resource which contains important concepts from a part in one learning material or a complete material (Wulandari, 2016). Handouts also direct students to be more active and also include illustrations and contextual issues close to the students. The content of the handout has also been in accordance with realistic learning criteria (Helmanda, 2012). According to (Fauzi, 2017) handout function is as a tool so that learners better understand the material being taught.

### IV. Conclusion

Based on the research that has been done, it can be concluded that:The PBL-based chemistry teaching material that has been developed has an average validation value of 78.04% by meeting the criteria worthy in terms of content, linguistic components, presentation components, and content components, so that PBL-based chemistry materials are feasible for use in the learning process.

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