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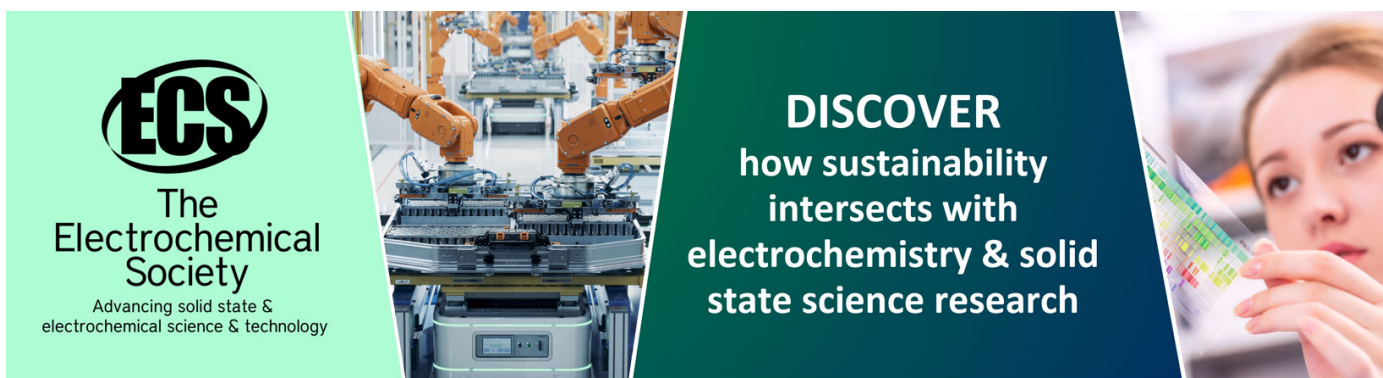
Analysis of electronic module development using model *inquiry based learning* with approach *contextual teaching and learning* in physics material of senior high school class X

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Analysis of electronic module development using model *inquiry based learning* with approach *contextual teaching and learning* in physics material of senior high school class X

I Ihsan *, Yulkifli, Festiyed

Physics Department, Faculty of Mathematics and Science, Universitas Negeri Padang, Indonesia Jalan. Prof. Dr. Hamka Air Tawar Padang, West Sumatra

*ihsanifzi27@gmail.com

Abstract. The rapid development of digital technology demands a simple learning resource that can be used by students in learning and understanding Physics learning independently. But in reality, the teacher and students still use printed teaching materials that are still dominated by the teacher in explaining the material without students being directly involved in solving a concept. The use of electronic modules and learning models and the appropriate approach is expected to increase students' understanding of the concept of physics. The purpose of this study was to determine the analysis of electronic module development using the model *Inquiry based learning* (IBL) with the approach *Contextual Teaching And Learning* (CTL) on Physics material. Respondents selected in this study were students of class X of SMA 1 and SMA 2 Pariaman. Based on observations, it was seen that students were not active and creative and had difficulty understanding the concepts in physics learning. Whereas for competency, attitude is very good, but for competence, knowledge and skills need to be improved. The results of the analysis be a reference the development of electronic modules using the model *Inquiry based learning* with the approach *Contextual Teaching And Learning* (CTL) to physics learning in class X high school.

1. Introduction

Education is one of the most important things in improving the quality of human life. Education always changes with the times and advances in Science and Technology. Technological development, it is expected that there is a learning media that can make physics learning fun, meaningful and able to develop students' skills in investigating and solving problems. Physics is a science that discusses phenomena through a series of processes that are built on scientific attitudes and the results are realized asproducts scientific which are composed of three important components in the form of concepts, principles and theories [1]. The facts that occur indicate that the competencies possessed by students are still quite low, which is indicated by the value of the daily Deuteronomy in the material of the vector of students of class X of SMA 2 Pariaman which is still much under the established minimum criteria of mastery learning.

The results of observations at SMAN 1 and SMAN 2 Pariaman, it was found that teaching materials used in the field were a kind of thick textbook, learning that was still centered on the teacher, and the use of learning models had not varied, and the approach used had not made the students



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experience learning meaningful. One of the learning models and approaches that make meaningful and active learners are *Inquiry Based Learning* (IBL) and approaches *Contextual Teaching Learning* (CTL). The IBL model is a learning that is able to involve children directly into real life by conducting their own investigation of a learning material [2]. The IBL model can also invite students to think critically, logically, and systematically [3]. Whereas the CTL approach used in learning aims to link learning material experienced by students in daily life. The CTL approach can motivate students to direct their own learning and to connect knowledge and application with each context found in their lives [4].

The IBL learning model and the CTL approach are very good if applied in non-technical teaching materials used, one of them is an electronic module. Learning physics by using electronic modules can help students learn independently, actively and creatively. For this reason, non-smart teaching materials are needed such as electronic modules in the learning process of physics. The purpose of this study was to describe the results of the needs analysis and analysis of students in developing electronic modules using the IBL model with the CTL approach to class X physics learning eyes.

2. Method

research carried out was the initial stage of research *and development (R & D)*. Development research is a process in which there are steps to develop new products or perfect existing products [5]. The subjects taken in this study were Physics subject teachers and XIPA class X students of SMAN 1 and SMAN 2 Pariaman. While the data collection instruments used were questionnaire sheets and interview sheets for needs analysis, as well as student questionnaires for the analysis of students.

For data analysis techniques using a Likert scale based on the questionnaire needs analysis and analysis of students. This aims to determine the extent to which the teacher and students accept or reject the statement given. The Likert scale is used in the form of statements whose answers form the scale of approval or rejection of the statements given by the observer [6]. The scale of the answers given by respondents who are qualitative are converted into ordinal scales so that they can be summed up well [7]. The provisions used to convert the statement, 4 = strongly agree, 3 = agree, 2 = disagree, 1 = strongly disagree.

The category of needs analysis and analysis of the characteristics of students is obtained by calculating all the scores obtained from each respondent. The score of each respondent is obtained by the equation:

$$S_k = \frac{\sum X_i}{X_{max}} \times 100\% \quad (1)$$

Where:

S_k : score obtained

X_i : score of each respondent

X_{max} : maximum score from questionnaire for each indicator

Questionnaire analysis to assess the needs analysis of each indicator using the provisions in Table 1.

Table 1. Categories Needs Analysis

Interval(%)	Category
0-20	Not good
21-40	Poor
41 – 60	Good Enough
61 – 80	Good
81 – 100	Very good

(modified from Riduwan [8])

3. Results and Discussion

3.1. Results Needs Analysis

In the needs analysis, the researcher conducted three analyzes, namely analysis performance, analysis of teaching materials, job analysis and analysis of learning difficulties and new concepts.

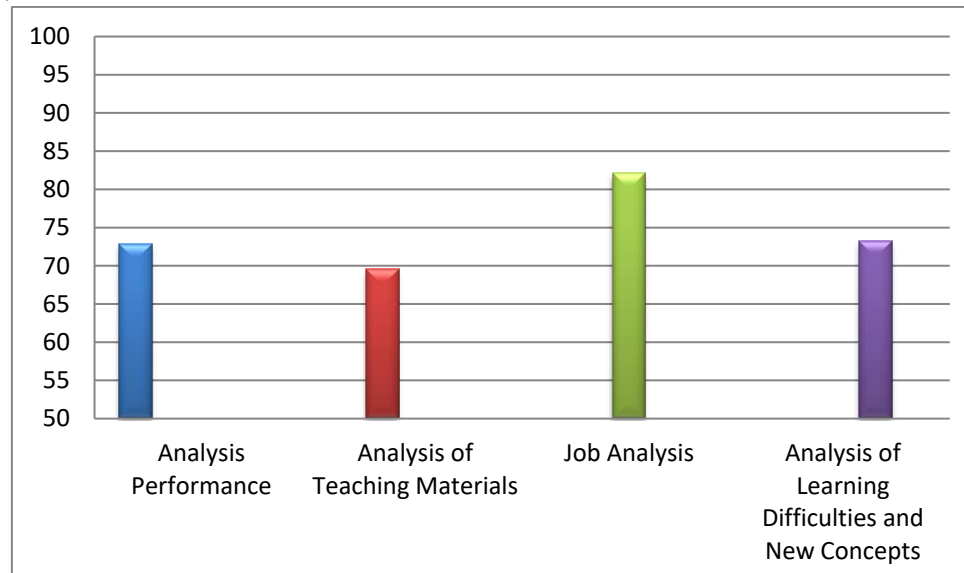


Figure 1. Needs Analysis Chart

Figure 1 shows that for performance analysis it is in good category. This shows that the teacher has prepared learning tools quite well, so that in the learning process students can be conditioned as expected. For the analysis of teaching materials teachers have tried to develop teaching materials on certain materials and teaching materials made in accordance with the instructions for the use of teaching materials that must have core competencies, basic competencies, learning objectives and others. But in the learning process teachers still rarely use non-printed teaching materials, teachers only use heavy and thick printed textbooks. In the learning to process the material presented has not been distinguished between facts, concepts, principles and procedures.

In the job analysis the teacher still rarely uses the laboratory in the learning process, while for the ongoing learning is still centered on [teacher center], with the teacher center learning will make students not active in learning. This is because the teacher still has not used a learning model that varies according to the 2013 curriculum, teachers more often use learning models *discovery learning* and conventional. The mastery of the class has been very good, because the teacher already has the experience that goes up.

Furthermore, in the analysis of learning difficulties and new concepts, students only have textbooks and sufficient students experience difficulties in understanding the symbols in physics learning, while the concepts that will be used for solving a problem even students are still confused. This is because learning only focuses on textbooks without students directly looking for the concept using good learning media.

3.2. Student Analysis Results

In the analysis of students, will observe seen how the actual abilities, learning styles, attitudes, knowledge and skills of these students.

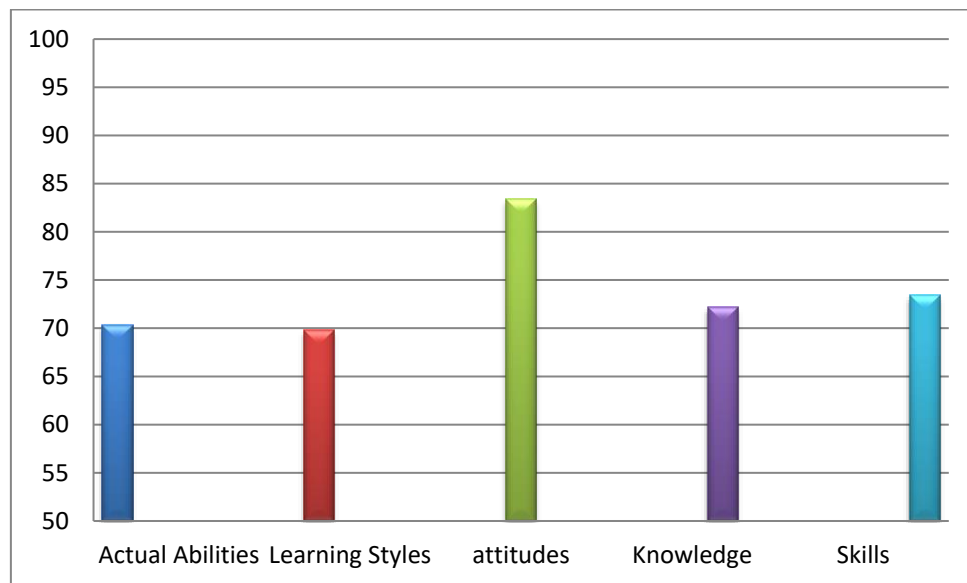


Figure 2. Student Analysis Chart

Figure 2. Shows the actual female students are not too good, the indicator of actual ability itself is general weakness, creativity and motivation. This shows that students are sufficiently motivated and creative in the physics learning to process. However, motivation and creativity must be improved to obtain more perfect results. While the learning style is still quite low, the indicators consist of visual, audiovisual and kinesthetic. The cause of the learning style is still low because the teacher in the learning process has not collaborated all the indicators in the learning style. The fighting style can be improved if the teacher uses non-printed teaching materials that contain all the indicators needed.

For knowledge and skills are still quite good because students find it difficult to understand the concept of physics and have not been able to solve problems related to the physics material provided, as well as the use of the laboratory in the process of skills improvement has not been maximized. This happens because students do not have a source book that can help them learn at home more simply and the teacher uses a learning model that varies with learning approaches that can link physical knowledge to everyday environment.

4. Conclusion

After conducting a needs analysis and analysis of students it was obtained that the competencies of students were still low. This is because the needs analysis, which consists of performance analysis, teaching material analysis, job analysis, and analysis of learning difficulties and new concepts, shows that the teacher still uses printed teaching materials that make it difficult for students to learn by themselves, learning models and learning approaches not yet optimally applied, because teachers still tend to use conventional learning models and the approach used by teachers is still not optimal. As for the analysis of students, which consists of actual abilities, learning styles, attitudes, knowledge and skills, it appears that students are still less motivated and creative in the application of printed books used. Based on this, it is necessary to develop an electronic module based on the IBL model using the CTL approach to physics material in class X semester 1.

5. Acknowledgments

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