Validity of basic Physics module on standard KKNI with problem-based learning model

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Abstract: The validity of module is important to gain recognition of the module suitability to the needs. The research aims to know the validity of physics module KKNI with problem-based learning model. The module becomes a form of teaching materials used to study independently in the learning process for students. To know the validity of the modules developed, then the validity analysis was necessary. The type of research is quantitative descriptive. The research method was validation questionnaire. The data was analysed by Cohen's Kappa technique. Validation results obtained from 5 reviewers consisting of 3 experts and 2 practitioners. The research results consist of content validation, construct validation, and language validation. Average content validation results 0.83, construct validation 0.82 and validation language 0.70 and it was categorized as valid. It can be concluded that the basic learning module of KKNI based learning with problem based learning model is valid with valid value per item validation > 0.61.

1. Introduction
Education is a planned effort to create a good atmosphere of teaching and learning process so that learners actively are able to develop their potential to obtain good spiritual, strength, self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation and country. National Education is one based on Pancasila and the constitution of the republic of Indonesia in 1945 which is rooted in the values of religion, national culture of Indonesia and responsive to the demands of changing times (Law No. 2 of 2013)

The increasing demands of global development towards the world of education face many challenges such as being able to give birth to individuals who can meet global demands. Therefore, education needs to get attention from government and education managers in order to meet the growing global demands. Globalization has resulted in changes in the overall life of society including education sector. Student mobility poses challenges for universities to gain recognition from the global community towards educational outcomes.

Government efforts to improve the quality of education in Indonesia especially in universities have been done, with the ongoing curriculum design, improvement of assessment standards of national and even international seminars on higher education. This led to the birth of a new curriculum based on Presidential Regulation No. 8 of 2012 on Indonesia National Qualification Framework (KKNI) which is a framework of qualification of competence that can match, equalize and integrate between the field of education and the field of job training and work experience in the provision of recognition work competence according to the structure of work in various sectors.
The qualification description of KKNI is expressed as the achievement of a learning which is gained through the internalization of knowledge, attitude, skills, and accumulation of work experience covering the aspects of the national identity, the mastery of science and technology, the ability to perform quality work, authority and obligations of a person in accordance with the level of qualification. The task and function of universities in the implementation of KKNI in accordance with Regulation of the Minister of National Education no. 73 of 2013, Article 9 paragraph 4 of each course of study shall prepare a description of learning achievement refers to KKNI in the field of higher education in accordance with its level.

The attainment of learning in Physics Education course is able to produce qualified physics lecturer. The learning system implemented refers to the standards of KKNI based on regulation of minister of research, technology, and higher education no. 44 Year 2015 on National Standards of Higher Education (SNPT) aims to ensure that learning in study programs, research, and community service organized by universities in all jurisdictions of the Unitary State of the Republic of Indonesia achieve quality according to the assessment criteria in SNPT to achieve learning achievement.

One of the fulfilments of learning achievement of graduates is the availability of learning resources in accordance with the KKNI that contain values of attitudes, knowledge, and skills refers to the formulation of learning achievement. One of the criteria of a qualified learning source is validity. It is the extent to which a measuring instrument carefully and precisely performs its function as a measuring instrument.

Physics education program of Faculty of Teacher Training and Education University of Pasir Pengaraian which equip students to have professional competence through several subjects in the field of expertise, Basic Physics is one of compulsory subjects. It is followed by physics education students in even semester. To support the learning activities, learning sources are required. They are all things tangible objects and people who can support the learning activities so as to cover all sources and can be utilized by teachers to happen learning behaviour.

Current conditions in the field of basic physics modules used by lecturers are still sourced from publishers and lectures have not been implemented maximally, due to incompatibility with student characteristics of the module used. Thus, it takes a learning module that can be a guideline for students in conducting basic physics-based KKNI with learning model so that students easily find the concept of basic physics lecture materials and more active.

The basic physics module developed based on KKNI with the learning model and discussion is simpler according to the characteristics of the students, containing the activity of learning and experimental activity and ending with the final test. One of the learning models that can be applied is learning model problem-based learning. Model of learning problem-based learning is a model of learning that begins with problems related to basic physical materials.

Basic Physics course is a basic course of department of physics that studies all phenomena of physics related to nature and surrounding objects as a basis in studying other subjects to be more specific. Efforts are made by developing the basic physics course module by linking KKNI as the basis of the college curriculum and given a model of PBL learning. PBL learning model is a learning model that more activities do based on the phenomenon or existing problems environment or fact. With the development of KKNI-based basic physics course module with PBL model this will make the lecture more maximal and better again.

Therefore, the context of this research is the development of basic physics course based on KKNI. The purpose of this research is to produce a valid module to be used in basic physics course in physics education program of University of Pasir Pengaraian by using problem-based learning model. Thus, the basic physics course can be a course that is liked and liked by students.

2. Research Method
This research is descriptive quantitative research which aimed at knowing the level of validity of basic physics subject module based on KKNI using problem-based learning model. The research method was done by using validation questionnaire. Validation data were obtained from 5 reviewers consisting
The Equation of Cohen’s Kappa is,

\[ \text{Kappa (k)} = \frac{P - Pe}{1 - Pe} \]  

where:

- **K**: Kappa that determines the product validity
- **P**: The optimized proportion which is obtained from the number of values given by the validator divided by the sum of the maximal values
- **Pe**: The un-formalized proportion which is obtained from the sum of the maximum value minus the total number of validated entries divided by the maximum number of values

The criterion of the Cohen’s Kappa is presented in the table 1.

### Table 1. Criterion of the validity decision based on Cohen’s Kappa (k)

| Interval         | Category |
|------------------|----------|
| ≥ 0.61 – 1.00    | Valid    |
| < 0.61           | Invalid  |

Source: Viera, 2005 [8].

The developed module is valid if it reaches the interval of ≥ 0.61.

### 3. Results and Discussion

The module assessment was done by 5 valuators. 3 expert reviewers were lectures of State University of Padang and 2 reviewers of practitioners were lecturers of physics education program of University of Pasir Pengaraian. The results of the module validation is displayed in the following table.

### Table 2. Results of Module Validation

| No. | Validation            | Average | Criteria |
|-----|-----------------------|---------|----------|
| 1   | Content Validation    | 0.83    | Valid    |
| 2   | Construct Validation  | 0.82    | Valid    |
| 3   | Language Validation   | 0.70    | Valid    |
|     | Total of Average      | 0.78    | Valid    |

Based on the validation result of the module assessed by the valuators in Table 2, it is found that total of average is 0.78 which is categorized to valid. Average of 0.83 is obtained based on content validation aspects which is categorized to valid. Content validation comprised the materials in the module using the problem-based learning model, the description of the material and the examples given which are relevant and attract the students’ attention, the material in the module contains explanations to support students' understanding, the material description in accordance with the topic of Basic Physics, the concepts reinforced by project steps and examples provided up to date and contextually.
Table 2 shows that the construction validation average value is 0.82 to be in valid criterion. The aspects of the construction validation were the presentation of systematic learning materials, containing clear presentation instructions, presentation in accordance with the rules of module development, the cover attracted the reader attention, the presentation of the material in the module enabled students to be motivated to learn, visually presentations and concepts, ideas, terms, formulas and conclusions are presented clearly, self study, material description on the learning model adapted to the problem based learning model, the module could be used anytime, the module gave the students opportunity to assess the learning result independently, the module was easy to use, the module could be studied repeatedly according to the level understanding of students, consistent in the use of symbols, colour combination and proportional writing size, and the font used was clear and legible.

Table 2 indicates that the average of language validation value is 0.70 to be on valid criterion. The aspects of language validation were sentences that were used in accordance with Indonesian rules, the language used was not ambiguous, the language used was communicative, and the spelling in accordance with the enhanced spelling and sentences used were easily understood.

Validation results showed that the basic physics course based on KKNI using problem-based learning model has been declared valid by the valuator. Sari (2014) suggests that the valuator are those who are expert in sciences. Validation of this module was done by those who were expert in the field of study consisting of 3 experts and 2 practitioners. 3 expert reviewers were Lecturers of State University of Padang and 2 reviewers of practitioners were lecturers of Physics Education University of Pasir Pengaraian.

4. Conclusion
Based on the validation results obtained, the average of total value was 0.78 on valid criteria. It can be concluded that the basic physics course module based on KKNI using problem-based learning model was valid. As the result, it is suggested that the module of this research can be made as consideration of lecturers in developing learning module to improve learning outcomes, students’ comprehension and students’ ability in solving problem.

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