

# Validity of Learning Module Natural Sciences Oriented Constructivism with the Contain of Character Education for Students of Class VIII at Yunior Hight School

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**Abstract.** Referring to primary data collected through observation and interview to natural science teachers and some students, it is found that there is no natural science teaching materials in the form of learning modules that can make learners learn independently, build their own knowledge, and construct good character in themselves. In order to address this problem, then it is developed natural science learning module oriented to constructivism with the contain of character education. The purpose of this study is to reconstruct valid module of natural science learning materials. This type of research is a development research using the Plomp model. The development phase of the Plomp model consists of 3 stages, namely 1) preliminary research phase, 2) development or prototyping phase, and 3) assessment phase. The result of the study shows that natural science learning module oriented to constructivism with the contain of character education for students class VIII of Yunior High School 11 Sungai Penuh is valid. In future work, practicality and effectiveness will be investigated.

## 1. Introduction

Education is all the efforts undertaken to educate people so they can grow and develop and have the potential or ability as appropriate. The Government is seeking various things to improve the quality of learning by improving the curriculum. What has recently been done is the improvement of the education unit level curriculum (KTSP) into the 2013 curriculum.

Development of curriculum 2013 focused on the formation of competence and character of learners in the form of alloy knowledge, attitudes, and skills that can be applied learners then follow the development of times. As one of the general lessons in junior high, science becomes one of the subjects that can support the formation and integration of the students' character values. Science subjects are expected to be a vehicle for learners to learn about themselves and the environment, as well as further development processes to be applied in everyday life. Science learning should encourage learners to be able to construct their knowledge independently through learning experiences (Sudarisman, 2012).

Based on the results of preliminary observations conducted schools, researchers found things that become problems in science learning. From the source of books in the library are still lacking in



meeting the needs of learners for the learning process, especially science subjects, learners rely solely on the explanation of teachers as sources and centers of learning information to them, have never used teaching materials such as modules, learners do not have Book packages or other teaching materials as a handle, learners have difficulty to build their own concepts, the ability of learners is still low in constructing the initial knowledge and still need to be guided by the teacher in constructing the initial knowledge, because subject of science lessons are still less enough according to learners, Being one of the factors that resulted in not all learners can construct knowledge initially well.

The existence of early knowledge to make learners can easily follow the learning process well. This is accordance with the theory of constructivism that the success of learning depends not only on the environment or learning conditions, but also influenced by the early knowledge of learners. Student learning outcomes are also closely related to the understanding of learners in understanding the concept of science subject matter and it is very important to do in the learning process (Patrianingsih, 2015). But not all learners have the same speed to understand the concepts of the subject matter discussed in the classroom. It is necessary for learning materials that can focus the capabilities of individual learners and can be studied independently with limited assistance from teachers with the aim of complementing the knowledge initially corresponds to the speed of learning to learners.

One that can solve this problem is teaching materials in the form of learning modules. Modules are teaching materials that are arranged systematically with language that is easily understood by learners and can be studied independently with limited help from teachers or educators (Purwanto, 2014). Modules are also printed materials that are designed to be learned independently by learners in learning, which has advantages in accordance with the principle of module writing is the feedback of the module so that learners can evaluate themselves (Director of Teaching Personnel, 2008).

In addition, the module also has many advantages compared to other written teaching materials, such as the purpose of learning more clearly and the ability of accommodation to the difference in the pace of learners in understanding the material (Nasution, 2010). Furthermore, according to Mulyasa (2006) module is a teaching material that contains learning materials are arranged in a systematic, operational and directed to be used by learners because it is accompanied by guidelines for its use. Sudjana and Rivai (2003) revealed that the purpose of learning with the module is t students able to follow the learning according to their own speed and ability.

In the results of previous studies, it turns out the module can help learners in understanding the material Biology. One of them is the result of research conducted by Elpitriani (2012) about the development of constructivism oriented biology learning module with a mind map. From this research, it is known that the module is very effective used in Biology learning in SMA and it can be seen that the use of module can improve learners' success in the material of excretion system. In learning using the module, learners can learn individually in the sense that they can adjust their learning speed with their respective abilities. In addition to the module, learners can measure their level of mastery of the given material.

A module as a delivery system in the learning process will be more optimal if oriented to a particular approach. One approach used in the development of this module is the constructivism approach. Based on these problems, the development of materials or guided learning resources, systematic, in accordance with the needs of learners, because with the exposure of structured materials will also help learners in building conceptual understanding and enable learners to learn independently. Independence of learners is expected to improve the ability to think and can measure the extent to which the level of understanding of the material through evaluation. One of the teaching materials that can make learners learn independently is the module.

The success of learning depends not only on the environment and learning conditions but also the initial knowledge of learners. Such knowledge can not be transferred intact from the teacher's mind to the learners, but actively built by the learners themselves through real experience. To support the improvement of students' understanding, so that learners can develop their initial knowledge and to learn more can be more meaningful, then the learning module is equipped with one of the learning approaches is the Constructivism approach. According to the Constructivism approach, learners

construct existing knowledge with their own experience to form new knowledge. Nurhadi (2003) argues in the view of constructivism, knowledge grows and develops through experience. Understanding develops deeper and stronger if always tested with new experiences.

Constructivism learning is a learning that develops learners' thinking to learn more meaningfully by working alone, finding their own, and constructing their own new knowledge and skills (Sumiati and Asra, 2007). Basically, learners do not bring empty heads to school, but actually, they already have the initial knowledge or concept of something based on experience in everyday life (Lufri, 2007).

In learning using constructivism emphasizes the development of skills, skills and thinking of learners (Isjoni in Sutisna, 2013). With the constructivism approach, the development of knowledge for learners can be done by the students themselves through research activities or direct observation, so that learners can channel new ideas in accordance with experience by finding facts that fit with the study of theory. Learners are also required to be able to link existing knowledge with new knowledge as well as experience in the learners (Tjulifa, 2013). This is the advantage and characteristic of the Constructivism approach than any other approach.

Science learning should encourage learners to be able to construct their knowledge independently through learning experiences (Sudarisman, 2012). Science learning according to Constructivism perspective contains four core activities, which are related to initial knowledge, real experience, social interaction and environmental sensitivity (Nuryanti, 2005 in Sudarsiman, 2012). By using constructivism-oriented modules it is hoped that learners can form new understandings based on their initial knowledge and learning experience. After learners understand the learning materials they are expected to become more motivated in learning.

In the development of learning-oriented constructivism-oriented science-learning module is used curriculum 2013. Curriculum 2013 aims to change the attitude of learners to be more polite through the values of character education contained in it. This means that if you have the attitude and mentality are praise-worthy learners will be able to absorb science well and certainly be a clean generation.

Science learning is one of the substances of national education that make an important contribution to the character formation of learners. This is in accordance with Junarso's opinion in Setyaningrum and Hasamah (2012). Character as a result of education brings meaning to life in society. Therefore, the importance of understanding the value of the characters implemented in the science lesson. According to the Minister of National Education (2010), character education in Biology subject is health care, religious, independent, tolerance, friendly/ communicative, social care, responsibility, and caring environment developed in accordance with the needs and conditions of learners in society.

Character education in this module is written explicitly on the subject of learning activities so that learners will indirectly learn about the characters that must be known. With this character, education is expected that learners not only get good output in the form of cognitive learning outcomes only but also form their (affective) attitude for better, so that between the cognitive and affective learning results obtained learners to be balanced. Learning using constructivism-oriented learning modules and character education-charged allegedly can help the understanding of learners so that learners can easily digest, remember and summarize the subject matter well.

The science-oriented instructional module constructivism is characterized by a character education developed to be tailored to the 2013 curriculum that provides the opportunity for learners to learn in their own way and ability and facilitate learners in understanding the material learned and improve effectiveness and efficiency in achieving learning objectives and enriches source of reading for learners.

Departing from the observations above, it is appropriate if in science learning a teacher can use teaching materials that can bring up the initial knowledge of learners, making learners can build their own knowledge, and improve understanding of the concept and motivation of learners that will lead to learning outcomes which are desired.

Based on the background that has been described, the authors are interested to conduct research entitled "Validity of Learning Module Natural Sciences Oriented Constructivism with the Contain of Character Education for Students of Class VIII at Yunion High School".

## 2. Development Methods

This research type is research development (development research). Another term often used for research development is design research (design research), this term is used by Plomp. Research development is an attempt to develop and produce a product in the form of materials, media, or learning strategies used to solve problems in the classroom and not to test the theory.

The stages of development of learning module of science-oriented constructivism-oriented character education using the Plomp model are as follows.

### *1. Preliminary Research Phase*

Activities are undertaken at this stage, as follows.

#### 1.1. Needs Analysis and Characteristics of Learners.

This analysis is conducted to determine the characteristics of the modules that students want, to examine the character of learners who become the target users of developed products and determine the module that the teacher wants as a tool in the learning process. Activities undertaken at this stage are, interviews with teachers and learners using an interview guide sheet. The results of the needs analysis are taken into consideration in the design and development of modules.

#### 1.2. Curriculum Analysis.

At this stage, a review of the curriculum is conducted. The analysis is carried out on the competence demands set forth in core competence (KI) and basic competence (KD). This analysis is conducted with the aim of determining the order and scope of the required material in accordance with the existing basic competencies, viewing the sequence of materials, identifying the material, presenting the problems in the material relating to daily life in accordance with the indicators and learning objectives. The results of this analysis are used as guidance in developing modules.

#### 1.3. Textbook Analysis.

The textbook analysis aims to find out the problems in the textbook such as the suitability of the content of the book with the Core Competence (KI), Basic Competence (KD) based on the 2013 curriculum so that it can be the basis for formulating the study material on developed modules.

### *2. Development and Prototyping Phase*

This phase begins after the preliminary research phase is completed. This stage aims to design the problem solving that has been identified at the initial identification stage. This phase has a microscope that helps in developing and improving the end result of the product. Activities undertaken in developing prototype include designing and developing the prototype, can be explained as follows.

#### 2.1. Development of Prototype I.

The design of Prototype in the early stages is called prototype I evaluated by self-evaluation by revising the IPA module designed using a check list. The evaluation itself is done to check the design errors that exist in the module. Next prototype I was revised and then continued at prototype II development stage. In order for a questionnaire instrument to be used, it must be validated first.

#### 2.2. Development of Prototype II.

Prototype II is a development stage by consulting with experts (expert review), ie IPA module discussed to the experts to obtain a valid IPA module. Validated aspects include aspects of the construct, content aspects, graphic aspects, and language aspects. Based on validation result, revision of IPA module is developed. In order for a questionnaire to be used, instrumentation validation was previously performed..

## 3. Results and Discussion

### A. Research Results

#### 1. Preliminary Research Data

##### 1.1. Results of Needs Analysis and Characteristics of Learners.

Needs analysis is conducted to determine the characteristics of modules used in order to attract learners in the learning process. Based on interviews with learners obtained information that learners

are more interested in the module with the complete material, clear writing, interesting to read, easy to understand or understand, and have a clear and interesting picture.

Based on the results of interviews with teachers SMP Negeri 11 Sungai Penuh Elni Fainofri, S.Pd obtained the information that in the learning process learners do not use teaching materials due to limited availability of teaching materials at school. This causes only teachers who hold and use instructional materials in learning while learners do not get the teaching materials. Teachers revealed that in the process of learning IPA learners still look passive, learners just copy what the teacher wrote on the blackboard and did not find other sources as supporting their understanding, learners receive more explanation from the teacher or listen to the teacher's lecture.

In addition, according to the teacher, the book of learners used by teachers in learning so far has not been presented in a complete and directed. For example in KD 3.6 should the presentation of the material must be complete and the order is clear, such as the material starts from the digestive system of food, the organ and digestion of food channels, the digestion of food both mechanically and chemically / enzymatic, and the linkage between digestive system with respiratory system and blood awareness system . While the presentation of the material in the book package only discusses the definition of food (energy needs and six types of nutrients) and food digestion channels while the linkage between the digestive system with the respiratory system, blood conscious system has not seen the discussion on the packaged book as a demand on KD 3.6.

Therefore, teachers expect the teaching materials with the delivery of complete and directed material in accordance with the KD demands that have been established, where the first submitted is a concept that must be understood besides that followed by its application in life. Then the teacher expects teaching materials that facilitate learners in understanding the lesson, can make learners can build their own concepts, and able to make all learners participate actively in learning activities.

Based on the results of the needs analysis of the characteristics of students then designed learning module science oriented constructivism charged character education. The learning-oriented science-oriented constructivism module is expected to be able to answer the expectations of teachers and learners. This is because the presentation of a systematic module and clear images will facilitate learners in understanding the subject matter. Constructivism approach will enable learners in the learning process because constructivism approach will guide learners in finding the concept of learning in accordance with predetermined objectives so that later learners will be able to build a true concept by linking the new knowledge they can with their initial knowledge have.

#### 1.2.Results of Curriculum Analysis.

Curriculum analysis aims to determine the Core Competence (KI) and Basic Competence (KD) that has been established in the standard content of science subjects. The results of KI and KD analysis contained in the content standard are translated into indicators of learning achievement.

The character-oriented constructivism-oriented IPA module developed from KD 3.6, 4.6 and KD 3.7, 4.7 with multiple submissions of competency achievement indicators. The curriculum analysis that produces indicators of achievement is different from the presentations in the teacher manual and the learners. In teacher handbooks and students the presentation of materials in KD 3.6 and 4.6 begins with the digestion system of food, food (energy needs and six types of nutrients) and food digestion channels, whereas in the module developed the presentation of the material begins with the digestive system of food (understanding the digestive system, food and its functions, energy needs, six types of nutrients), food digestive organs, food digestion channels, food digestion process, as well as linkages of the digestive system with respiratory system and blood-conscious system. This is done because based on the KD that has been established in the content standard, that learners must understand the concept of the digestive system as well as the linkage between the digestive system with the respiratory system and circulatory system.

Whereas in KD 3.7 and 4.7 in teacher handbooks and learners the presentation of the material begins with natural and artificial additives and addictive substances-psychoactive, while in the module developed the presentation of the material begins by explaining the definition of additive and mention the type of additive substances in the food consisting of the natural and artificial coloring, sweetening,



preservatives and flavorings of food, explains the notion of addictive substances consisting of non-narcotic addictive substances and psychotropic substances, addictive substances of narcotics and psychotropic addictive substances and explains the negative effects of addictive and psychotropic substances for health and Proposed the idea of solving the circulation problem of psychotropic addictive substances in Indonesia. This is done because based on the KD that has been specified in the content standard, that learners should understand the concept of additives naturally and artificially in foods and beverages and addictive substances-psychotropic substances and their effects on health and how to solve the problem about substance abuse- psychotropic addictive.

### 1.3.Results of Textbook Analysis

Analysis of the book is done in the handbook of learners, this analysis aims to know the contents and presentation of content as a comparison for module development. Where the presentation of the material on the handbook of learners there that is correct based on the demand of KD is in the handbook of learners have been explained understanding the digestive system of food and organs in the digestive system of food and the handbook of learners already using a learning approach that is the scientific approach and the picture presented in the handbook of learners is quite complete only there are still some pictures that are less clear because the picture is blurred and the description is not complete. Analysis of the handbook of learners conducted by researchers with three components namely systematic, content and assessment. From the results of this analysis note that there are still some weaknesses in the handbook of learners. First, there are some material points that should be included in the picture to be clearer, but not included. Second, the image in the material presentation looks less clear because the picture is blurred and the description is not complete, such as the image of the oral cavity and anatomical structure of the small intestine, should be presented images must be clear and representative for learners more interested in reading and learners easily know the meaning of the picture presented. Third, the presentation of the material on the packaged book is still incomplete and directed so that learners need the help of others such as teachers to explain the contents of the book. Consequently, communication takes place in one direction and learners have a tendency to passive in the learning process.

### 2.Data of Development and Prototyping Phase.

The results obtained at the initial investigative stage were used as guidelines in developing a constructivism-oriented IPA oriented character education module. The results of the development carried out at this stage are as follows.

#### 2.1.Prototype I (Design).

Prototype I start from the design and manufacture of constructivism-oriented IPA oriented character education module. The module contains the cover, introduction, module instruction manual, core competency, basic competence, competency achievement indicator, learning objectives, material description, drawing, summary, competency test, answer key, feedback, glossary, and bibliography. The IPA learning module is designed with Microsoft Office Word 2007 and Microsoft Office Publisher 2007.

##### 2.1.1. Cover.

In Cover, there are images related to the material contained in the module. The goal is that learners are interested to learn the modules developed.

##### 2.1.2. Foreword.

The preface contains a thank-you note for the completion of the developed module, the module user's goals, the purpose of the module development, and the components contained in the module.

##### 2.1.3. Module Use Instructions.

The instructions for using this module are designed to facilitate teachers and learners in using the module.

##### 2.1.4. Indicators of Competence Achievement.

This indicator contains the learning objectives to be achieved in the creation of a constructivism-oriented IPA oriented module of character education.

##### 2.1.5. Material Description.

Contains material developed in a constructivism-oriented IPA oriented character education module.

#### 2.1.6. Picture.

Images displayed in the material-related module will improve the learner's understanding.

#### 2.1.7. Summary.

The summary contains conclusions about the materials.

#### 2.1.8. Competence test.

The competency test contains questions to evaluate the achievement of indicators on previously learned material.

#### 2.1.9. Key Answer Competency Test.

The key to the competency test answers contains the correct answers to the questions given. The key answer is for students to check which answers are correct and which answers are wrong from the answers they provide after they have done the competency test.

#### 2.1.10. Feedback.

Feedback contains instructions to calculate the learning mastery of learners. This learning feedback aims to learners can learn to learn mastery.

#### 2.1.11. Glossary.

Specific terms that are difficult to interpret in the material discussed and the new terms that learners need to understand are explained at the end of the module in the glossary.

#### 2.1.12. References

The references contains the literature used in the constructivism-oriented IPA oriented module of character education.

#### b. Prototype II (Self Evaluation)

The results of the evaluation itself indicate that the module components already exist and accordingly. However, there are some errors that occur that there are some posts whose letters are not complete so that its meaning becomes unclear, in the picture, there is not yet have the source. After the evaluation, it was revised by improving the incomplete writing and complete the source on the drawing so that the resulting learning module of science-oriented constructivism is characterized by character education.

#### c. Prototype III (Expert Validation)

In prototype III development stage, the formative evaluation activity is done that is seeing the validity of learning module of science-oriented constructivism based on character education based on expert's judgment which includes four aspects of construct, content, graphics, and language and legibility. Evaluation tool used is a validation sheet of learning module science oriented constructivism charged character education. Validation is done by six expert validators. In addition to assessing the module, the validator is also required to provide suggestions for improvements to the module. The suggestions provided by the validator are then used as a reference to revising the developed module.

Data of validation of learning module of science learning oriented constructivism with character education can be seen in Table 1.

**Table 1.** Data of validation of learning module

No	Aspects of Assessment	Average (%)	Category
1.	Aspects of constructs	89,58	Very Valid
2.	Aspects of Content	90,47	Very Valid
3.	Aspects of Graph	92,59	Very Valid
4.	Aspects of language	91,67	Very Valid
	Average	91,07	Very Valid

Based on the overall average result of validation learning module natural sciences oriented constructivism with the contain of character education 91,07% with very valid category.

#### B.Discussion

### 1. Validity of Science Constructivism-oriented Learning Module Loaded Character Education

The validity of science-oriented instructional module constructivism-charged character education is rated very valid by the validator. This is obtained from the data analysis of the validity value given by each validator with four aspects of the assessment, namely the aspects of constructs, contents, graph, and language. According to Trianto (2010) valid means that the assessment has provided accurate information about the developed teaching materials, teaching materials in the form of modules developed otherwise valid after meeting the aspects of the construct, content aspects, aspects of graft, and language aspects. The results of the product validity assessment on the constructed aspect into the category is very valid. Based on the above-mentioned modules are developed in accordance with this competence, basic competence, and defined learning objectives.

In the content aspect, the module is declared very valid. Validity in the aspect of the content provided by the validator due to indicators of achievement of competencies has been prepared and sorted by KI and KD in the curriculum 2013. The module also contains materials, learning material constraints, instruction learning activities, exercises designed systematically and interesting to achieve competence Expected. In addition, in the module, there is also a way of evaluating each submateri that aims to learners can learn by themselves. This is in line with the opinion of Sudjana and Rivai (2003), the purpose of teaching with the module is that learners can follow the teaching program according to their own speed and ability, more self-study, can know their own learning result, and emphasize the optimal mastery of learning materials Mastery learning) with a mastery level above 80%. Based on the above, the module developed has been in accordance with defined learning objectives.

Further validity is assessed from the aspect of the graph, in terms of aspects of the module of graph expressed is in very valid category. A very valid value is given a validator based on some indicators. First, it states that the module design is interesting. The developed modules are designed to be as attractive as possible using Microsoft office word 2007 and Microsoft office publisher 2007 programs. Second, fonts are used in more than one type with clear font sizes being read. The reason for the use of some types of letters is to add to the attractiveness of a character-oriented constructivism-oriented module of character education, to avoid the boredom of learners while reading, and to distinguish between material and titles. Muslich (2010) argues to distinguish and get a combination of display letters, can use variations and series of letters.

Third, the suitability of the presentation of the image. This is evidenced by the image on the module can be seen clearly, the image of the quotation includes the source and description of the image in accordance with the given image. This aims to facilitate learners in understanding the images displayed so that the images displayed can clarify the concept of material that must be understood by learners. This is in accordance with Rustaman (2002) that the module should be well designed to attract readers, both in size (paper, letters, and pictures) and from the variations. The same thing is also expressed by Galitz, et al (in Festiyet, 2008) the display of interesting learning media with images and objects in accordance with the demands of the material, will increase the interest of learners to the learning materials. Furthermore, Pratowo (2011) said that the presentation of the drawings is needed to support and clarify the contents of the material because in addition will clarify the description can also increase attractiveness and reduce the sense of boredom learners to learn it.

The last validity assessed is the aspect of language and readability. Assessment of the language aspects of the modules developed is in very valid categories. This is due to the structure of the sentences used in accordance with the EYD, in accordance with the level of understanding of learners, simple, clear and unambiguous, making it easier for learners to understand the learning activities in the module, and communicative. Hamdani (2011) stated that the things that need to be considered in the preparation of the module are the accuracy in preparing the sentence so that the module is composed communicative and easy to use as a learning guide for learners. This is also reinforced by Prastowo (2011) module is basically a teaching material that is arranged systematically with language that is easily understood learners, according to their knowledge level and age.



The four aspects of the validation of learning content learning module validated by constructivism containing character education that has been described is a unified whole and mutually supportive for the perfection of learning-oriented constructive science-oriented learning module developed character education. Based on the results of the analysis of the prevalence obtained an average value of 91,07% is with very valid category. According to Sugiyono (2008), a measuring instrument is valid if it can be used to measure what should be measured. The same thing is also stated by Arikunto (2012) if a data generated from a product is valid, then it can be said that the developed product has provided a description of the development goals correctly and in accordance with reality or the real situation. A very valid assessment of the learning-oriented constructivism-oriented IPA learning module developed this character that signifies that the module can be used as teaching material in learning..

#### 4. Conclusion

Based on the development and experiments conducted on science-oriented learning module constructivism-filled character education obtained the following conclusions.

The science-oriented learning-oriented constructivism-oriented module of character education on the material of digestive system of food and chemicals in life for SMP class VIII developed has been declared is very valid by the expert validator with very valid category (91,07%). The validation of science-oriented learning module constructivism is characterized by character education in terms of construct, content, graph, and language.

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