

The Development of Learning Tools for Animalia Concept Based on Guided Inquiry Model in High School Grade X

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Abstract

Learning tools are instruments or equipment to carry out the learning process, worksheets, media, methods, and assessment rubric that will be used by the educators and students in their learning activities. This research aims to describe the validity of Model Learning Device Development Guided Inquiry on Animalia Concepts in Class X High School. The method that used in this research is *Evaluation Development Research (EDR)* through *Tessmer Formative Evaluation* which is limited only to expert validation. This type of research is a research development to produce products in the form of Syllabus, Lesson plan, worksheet, and valid Teaching Materials. The results showed that: 1) The validity of the syllabus developed based on expert tests has a very valid category, namely 100%, 2) The validity of the lesson plans that are developed based on expert test has a very valid category, namely: 92.19%, 3) Validity of worksheet developed based on test experts have a very valid category, namely 92.5%, and 4) validity on teaching materials developed based on expert tests have very valid category that is 92.56%.

Abstrak

Perangkat pembelajaran adalah alat atau perlengkapan untuk melaksanakan proses pembelajaran, lembar kerja, media, metode, dan rubrik penilaian yang akan digunakan pendidik dan peserta didik melakukan kegiatan pembelajaran. Penelitian ini bertujuan untuk mendeskripsikan validitas Pengembangan Perangkat Pembelajaran Model Inkuiri Terbimbing pada Konsep Animalia pada SMA Kelas X. Metode penelitian yang digunakan yaitu *Evaluation Development Research (EDR)* melalui Evaluasi Formatif Tessmer yang dibatasi hanya sampai validasi ahli (*Expert Validation*). Jenis penelitian ini merupakan penelitian pengembangan untuk menghasilkan produk berupa Silabus, Rencana Pelaksanaan Pembelajaran (RPP), Lembar Kerja Peserta Didik (LKDP), dan Bahan Ajar yang valid. Hasil penelitian menunjukkan bahwa: 1) Validitas terhadap silabus yang dikembangkan berdasarkan uji pakar memiliki kategori sangat valid yaitu 100%, 2) Validitas RPP yang dikembangkan berdasarkan uji pakar memiliki kategori sangat valid yaitu 92.19%, 3) Validitas terhadap LKPD yang dikembangkan berdasarkan uji pakar memiliki kategori sangat valid yaitu 92.5%, dan 4) validitas terhadap bahan ajar yang dikembangkan berdasarkan uji pakar memiliki kategori sangat valid yaitu 92.56%.

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A. Introduction

The teaching and learning process greatly determines what activities will be carried out by students during the learning process. Teachers are required to be able to understand and have adequate and professional skills in carrying out their duties, so the teacher is asked to have proper skills and be able to understand in developing various forms of effective, creative learning models, and fun (Hosnan, 2014).

Learning in Curriculum 2013 (K13) is using a more scientific approach that is centered on the students, while the teacher is only a facilitator. Models that match the scientific learning approach are discovery-based learning (*Discovery Learning*), inquiry-based (*Inquiry*), problem-based learning (*Problem Based Learning*) and project-based learning (*Project Based Learning*). Model learning in which its activities the teacher provides considerable direction to students, is a guided inquiry learning model. This learning model has advantages, namely emphasizing the development of cognitive, affective and psychomotor aspects as much and giving the will to the students to learn according to their own way of learning (Fathurrohman, 2015).

According to Hosnan (2014) inquiry learning emphasizes the process of searching and discovering. The role of students in this learning is to explore and get their own information about the subject while the teacher becomes the facilitator and guides them to learn. Inquiry learning is an arrangement of learning activities that focus on critical and analytical thinking processes to find the answer to the problem in question.

Research on the application of the inquiry learning model has been reported, including those presented by Wulandari (2019) which applied the guided inquiry model and NHT Cooperative model to improve the learning outcomes of high school students. Qomariah (2014) concluded learning using the Guided Inquiry model on Kingdom Animalia can improve the learning outcomes of high school students. Ni'mah (2019) that applied the guided Inquiry model learning on the concepts of human circulatory system, proving that it can improve student activities and learning outcomes in high school.

Based on the results of those studies, there are no K13-based devices used yet. Therefore, a standard learning device is needed to teach the concept of kingdom animalia according to the biology syllabus of SMA K13 which is taught in class X based on Guided Inquiry. This is also shown by the information collected from Biology teachers at the MGMP in Biology at the Banjarmasin Municipality. Even though the teacher

has implemented the 2013 curriculum, in practice the Animalia concept is difficult to apply, because the material is very large and quite complicated, making it difficult for students to understand and remember the material being taught and not in accordance with the time division in the 2013 curriculum which is only 12 JP. In addition, there is no appropriate learning tool for the implementation of the Animalia concept.

The concept of Animalia according to the Biology syllabus of SMA K13 is taught in class X semester II with Basic Competence (KD) 3.9 which must be achieved by students, namely "Group animals into phyla based on body layers, body cavity symmetry, and reproduction". It is still difficult for students to be brought into the implementation of learning tools where students are asked to be active in learning and the teacher is only a facilitator, so there is a need for learning tools that help students to understand. Therefore, the teacher must make the learning process interesting and fun for students in learning, and make students active through proper planning, namely preparing devices that are truly in accordance with these conditions.

Learning tools contain designs, learning processes, worksheets, media, methods, and assessment rubrics that will be used in the learning process which is one of the supporting factors for successful learning. So learning tools is an equipment to carry out a process that may occur in the learning activities between educators and students. According to Zaini and Hidayati (2019) learning device plans are developed for specific purposes, including so that student learning outcomes (products and processes) exceed classical completeness, student performance skills become better, student character behavior (discipline and responsibility) becomes better, student social skills (work together and contribute) ideas to be better, and other outcomes such as students' critical thinking skills.

The preparation of learning tools is part of learning planning; it is contained in Permendikbud No. 65 of 2013 concerning Standards for Primary and Secondary Education. The learning tools in this study are the learning syllabus, the lesson plan, and the Student Worksheet and teaching materials.

Based on this description, a research entitled "Development of Animalia Concept Learning Devices Based on Guided Inquiry Models in High School Class X" was conducted with the aim of describing the validity of the development of these learning tools.

B. Materials and Method

The development of these learning tools used the Educational Design Research (EDR) model through formative evaluation of the tessmer. *Education Design Research* is a systematic study of designing, developing and evaluating educational interventions (such as programmes, strategies and learning materials, products and systems) as solutions to complex problems in educational practice. Tessmer's (1998) Formative Evaluation was only carried out in stages (1) *self-evaluation* and (2) *expert review*.

This research was conducted for 6 months, from January 2020 to June 2020. Overall this research was carried out for 1 semester and the research was carried out at the Biology Education Study Program, FKIP ULM Banjarmasin. The research subjects were 2 experts as validators

consisting of 2 supervisors, namely supervisors 1 and 2. The object of this research is a research instrument which includes the syllabus, lesson plans, worksheet, and teaching materials on the Animalia concept material.

The calculation of the expert validation score is carried out using the formula according to Akbar (2013).

$$V = \frac{TSe}{Tsh} \times 100\%$$

Information:

V : Validity

Tse : Total validation score from validator

Tsh : Total maximum expected score

The validity results obtained can be matched with the presentation criteria according to Akbar (2013) in table 1.

Table 1 Category for Validity

No.	Number	Validity Category
1.	85.01%-100%	Very Valid or can be used without revision
2.	70.01%-85.00%	Quite V alid, or can be used but need minor revision
3.	50.01%-70.00%	Not valid, it is recommended not to use it because it needs a major revision
4.	01.00%-50.00%	Invalid, or should not be used

Source: Akbar (2013)

C. Results and Discussions

This research produces a very valid Guided Inquiry-based biology learning tool, which is used especially for the subject of the Animalia concept in SMA Grade X/Ten. This tool is made in several stages, including self-evaluation and expert testing. The self-evaluation carried out by the researcher is to analyze the learning tools that will be developed in the form of syllabus, lesson plans, worksheet, and teaching materials and collect Animalia concept learning tools from previous research. Then make improvements to writing errors, material sequences, cover designs and more interesting image arrangements so that the resulting learning tool developed is in the form of draft I to be validated then goes through the validation stage by 2 validators. The learning device in this study is considered valid if the validator score is in the very valid category based on the criteria of Akbar (2013). It is important to do validation tests to ensure the feasibility or validity of the learning tools to be used. The results of the recapitulation of the validation assessment by the validator on the developed learning tools can be seen in table 2 below.

Based on table 2, the tools validated by the validator are the syllabus, lesson plan, Student Worksheet, and teaching materials. The validation stage was carried out by 2 experts from University of Lambung Mangkurat. First, an expert on the

concept of animalia. Second, an expert in the field of Biology learning planning.

Table 2 Recapitulation of learning device results

No.	Device Type	Average Score (%)	Validity Category
1.	Syllabus	100	Very Valid
2.	Lesson plan	92.19	Very Valid
3.	Worksheet	92.5	Very Valid
4.	Teaching Materials	92.56	Very Valid

Based on the data, Table 2 shows that the learning tools validated by the validator are all very valid for use in the teaching and learning process. The Ministry of National Education (2008) explains that product validation aims to obtain recognition or validation of product conformity with needs so that it is feasible and suitable for use in learning. Product validation is very important so that it can be known where the weaknesses or shortcomings of learning tools developed in terms of relevance, accuracy, language and learning are, as explained by Setyosari (2010) that expert tests or validations carried out with expert respondents are useful for reviewing initial product and provide feedback and improvements.

Expert validation is one of the activities carried out in research and development on the Tessmer model, namely in expert review activities. Expert review (expert test) is one of the validity tests to get input, suggestions, comments. Based on

the results of validation by experts, revision of learning tools still needs to be done based on suggestions and input by validators to produce products that are suitable for use. This revision is very important to do to produce a better product (Sugiyono, 2010).

It is known that the syllabus validation by experts is 100%. The syllabus in this case has a very valid validity meaning that it can be used without revision. In Permendikbud No. 68 of 2014, the syllabus compiled is in accordance with the syllabus preparation procedure, meaning that the syllabus developed and compiled by researchers contains the identity of subjects, KI and KD, learning materials, learning activities, indicators of competency achievement, assessment, time allocation, and learning resources. The complete syllabus contains indicators or aspects of Guided Inquiry which has a description of the material that students need to learn in order to achieve competency standards and basic competencies. This means that the developed syllabus can be used as a guide for the preparation of lesson plans, worksheet, and teaching materials.

The results of the lesson plan validation are 92.19% (very valid), and can be used in learning. The lesson plan made is in accordance with the references contained in Permendikbud No.65 of 2013. The learning activities developed are also complete with the syntax or steps of Guided Inquiry.

The results of the worksheet validation obtained 92.5% which means it is very valid, this shows that the developed worksheet can be used in learning based on the Guided Inquiry learning model. The worksheet is prepared based on the steps of Guided Inquiry, inquiry-based learning emphasizes that students are more active in learning and working scientifically to find and create knowledge for students, as evidenced by the help of worksheet in everyday students are increasingly trained in carrying out the syntax of Guided Inquiry. According to Zaini *et al.* (2019), the level of validity of an worksheet shows the level of conformity with the characteristics of the worksheet according to experts, and this result will affect the practicality of the content.

The results of the validation of teaching materials of 92.56% indicate a very valid category. Overall, the developed teaching materials can be used without revision, although revisions are still made based on the suggestions and inputs given by the validator. Teaching materials have a very important meaning for teachers and students in learning activities. Teaching materials are seen as tools that are clearly able to provide information, knowledge, and develop abilities in such a way that

teaching materials can be understood well by educators and students. Teaching materials are also the main supporting facilities for the teaching and learning process that contain important concepts and are supported by information in the form of data and facts to facilitate educators in carrying out learning and building effective learning communication for students (Depdiknas, 2008; Amri and Ahmadi, 2010; Riyani, 2012). According to Belawati (2003), meaningful teaching materials are teaching materials that are careful, use a consistent format and are packaged in an attractive manner, and are easy for students to understand. Based on the assessment by these experts, all components of the learning device can be used based on the range of validity criteria by Akbar (2013).

The learning tools developed are very valid and feasible to use. This agrees with Jaya *et al* (2014) explaining that the learning tools that have been developed at least meet the valid requirements and are suitable for use. Dewi *et al* (2013) also stated that the development of the learning device if the components in it are in accordance with the indicators that have been set on the validity instruments of the learning device, then it has been declared a valid category. Plomp and Nieveen (2007) also explain that learning tools are of high quality if they meet the criteria of validity as a result of a product development. The validity in this study is based on the opinion of Akbar (2013), the assessment of the validation of experts or validators, for the minimum validity criteria provisions are quite valid for the learning tools used. Agree with Lissa and Indriyanti (2012) stated that the validity is said to be good with the range of categories of validity scores ranging from moderate to good.

Nurfadila (2016) states that if the expert assessment of the validator shows that the development of the device is based on a strong theory, namely that there is an interrelationship between the components in the device being developed, the learning device is said to be valid. Several factors cause the device to be said to be valid, one of which is that there is a match between the components and the learning indicators. The results of research that have been previously reported, according to Saputra *et al* (2016), concluded that learning tools that can improve mastery of concepts can also train critical thinking skills based on an inquiry model. Fadilah *et al* (2015) also concluded that biology learning tools using the human Excretion system inquiry model can train critical thinking skills. Development research is very much needed to produce valid guided inquiry-based learning tools so that they are

suitable for use in training students' critical thinking skills.

The Animalia concept learning device based on this guided inquiry model has the following advantages:

1. The learning syllabus that has been used completely contains indicators or aspects of the Guided Inquiry model which has a description of the material that students need to learn to achieve competency standards and basic competencies.
2. The fully developed lesson plan contains indicators or aspects that contain the Guided Inquiry model and helps students find their own directions and activities that must be done to solve the problems given by the teacher.
3. Worksheet is specially processed to guide students in conducting experiments and being able to draw conclusions because it requires students to be more active in learning and working scientifically to find and build new knowledge for students.
4. Teaching materials have an aspect of completeness of material or content that contains kingdom Animalia in a concise, clear, and interesting way, the material section is also equipped with relevant pictures, the language contained in the teaching materials is simple and easy to understand and the cover design display is available. animals representing Invertebrates and Vertebrates.

D. Conclusion

The results of the validity of the development of the Animalia concept learning device based on the Guided Inquiry Model at SMA Grade X are classified as very valid criteria. The validity is shown by the assessment of 2 experts, namely 2 supervisors in the form of Syllabus which has a validity value of 100%, lesson plan which has a validity value of 92.19%, worksheet which has a validity value of 92.5%, and Teaching Materials which has a validity value of 92.56% with the need for revision or improvement for product perfection.

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