

# Validity of Guided Inquiry Based Spermatophyta Sub Materials E-Book as an Additional Learning Resource

1st Nur Sakinah Hasibuan<sup>1</sup>, 2nd Syarifuddin<sup>2</sup>, 3rd Ashar Hasairin<sup>3</sup>

{nursakinahasibuan84@gmail.com<sup>1</sup>, syarif.ecol@yahoo.com<sup>2</sup> asharhasairin@unimed.ac.id<sup>3</sup>}

Biology Education Program Postgraduate School, Universitas Negeri Medan, Jl. Willem Iskandar, Pasar V, Medan, 20221, North Sumatra, Indonesia<sup>1,2,3</sup>

**Abstract.** This study aims to determine the validity of e-books guided inquiry-based spermatophyta sub-material as an additional learning resource. Subjects according to material experts, design experts layout, an expert on instructional design and student feedback. This type of research is development research using the ADDIE model. This research is only up to the development stage. The results showed that based on the assessment of the material expert team, it was 88.5 in the very feasible category, design expert layout a score of 97.4 was obtained in the very feasible category and the learning design expert obtained a value of 88.0 in the very feasible category. Can be concluded that e-books guided inquiry-based spermatophyta sub-material is appropriate and quite effective for use in learning.

**Keywords:** E-books, Spermatophyta, Guided Inquiry, Validity.

## 1 Introduction

The number of internet users in Indonesia increased from 64.8% to 73.7% of the total population of 266.9 million. Therefore, the use of smartphones has made it easier for students to read through digital media, such as e-books accessible anytime and anywhere. As more and more people use smartphones, print media is starting to be abandoned by readers. Today's youth prefer to access mass media via cell phones, computers or other digital devices. Through the internet we can access digital learning resources such as e-book, e-journal, e-learning, digital libraries, learning videos, YouTube, game learning, some are even application-based such as Ruang Guru, Quipper, Zenius [12].

The learning process is inseparable from its components such as teachers, students, learning objectives, learning materials, methods, learning media and learning evaluation. The learning process is a main school activity. Learning is all efforts made by educators so that the learning process occurs in students. In learning there are activities to choose, define and develop methods to achieve the desired learning outcomes. An effective learning process is teaching

that is able to produce a quality learning process [10]. Based on development needs analysis e-books Guided inquiry-based spermatophyta sub-material through filling out questionnaires for students found that students experienced difficulties in spermatophyta sub-material lessons. This is because the pictures in school textbooks are less attractive, less colorful, less large and the examples in each family are still small. Therefore, most of the students who have filled out the research questionnaire require e-books guided inquiry-based spermatophyta sub-material as an additional learning resource.

Learning resources are a collection of materials or situations that are collected intentionally and made so that students are able to learn individually. Learning resources are also all types of media, objects, data, facts and ideas that can facilitate the learning process for students. The learning resources used in learning activities are of various types and forms, such as books, videos and teaching aids as important factors in the teaching and learning process. Educators who are able to use learning resources will look authoritative in front of students, because it creates an impression and is not out of date [14]. Based on research that a quality book is size font for text 12-14, colors for photos are clear and attractive, there are prefaces, table of contents, glossary and index [7].

E-books, namely books designed in electronic form. E-books not just an ordinary book but e-books can also be equipped with interactive media such as videos, learning animations and others. With the sophistication of technology and information today, e-books can be designed to be an attractive electronic book with sound accompaniment and an attractive appearance, so that it can increase students' motivation in reading [6]. Effectiveness e-books are used in learning to foster critical thinking skills. E-books has advantages in terms of its use such as being easily accessible anywhere, anytime and cost-effective. Generally e-books in demand because the size is smaller than the printed book has a search feature so that the words in e-books easy to find [13]. Spermatophyta sub-material is material that contains long descriptions and clear pictures. However, the objects in each order are little described in textbooks where there are only six families and each family is only two examples. So, it is necessary to take advantage of other learning resources that contain the types/species and characteristics of spermatophyta. Learning resources that contain pictures and concepts will be one of the solutions in making learning activities more interesting. So that it makes it easier for students to understand the material, especially the learning media used are already digital-based which can be accessed via smartphones.

The guided inquiry model is a learning model in which the teacher provides extensive guidance/instructions for students. This model is usually used for students who have never used the inquiry model. The syntax of the guided inquiry learning model according to Purwanto is as follows: 1) orientation; 2) formulate the problem; 3) formulate hypotheses; 4) collect data; 5) test the hypothesis; and 6) formulate conclusions. From the explanation above, it needs to be developed e-books guided inquiry-based spermatophyta sub-material as an additional learning resource [4].

## **2 Method**

### **Types of Research**

Development research (Research and Development) uses the ADDIE model developed by Reiser and Mollenda with five stages, Analysis, Design, Development, Implementation and Evaluation.

### **Time and Place of Research**

The time of this research was carried out in October 2021 - May 2022. The location of the product development research was carried out at the Biology Education Postgraduate Program, Medan State University which is located at Jalan William Iskandar Pasar V Medan Estate Postal Code 20221 Medan. Product trials and evaluations were carried out at Binjai 3 High School (SMA) located at Jl.Padangsidimpuan No. 24, West Rambung, South Binjai, Sumatra North 20723.

### **Data Collection Instruments and Techniques**

The instruments used in this study were the due diligence instrument by the material expert validator, the due diligence instrument by the design expert validator layout and qualification test instrument by learning design expert validator. Development of instruments to test eligibility and use e-books submaterial spermatophyta as an additional learning resource developed. Each instrument has a different number of aspects according to development needse-books. Data collection was carried out by using a questionnaire, then analyzed descriptively. Rating score using a scale likert with a score range of 1-4 with criteria not feasible, less feasible, feasible and very feasible.

### **Development Research Procedures**

The procedure in this study consists of five stages namely Analysis (analysis), Design (planning), Development (development), Implementation (implementation) and Evaluation (evaluation).

#### **Development Design E-Books Sub Material Biology of Spermatophyta Based on Guided Inquiry**

The design stage was carried out to design the cover, the contents of the guided inquiry-based spermatophyta sub-material. Cover design and content e-books biology sub material spermatophyta using Microsoft Word. The final results of each design are combined in pdf form and then converted using software Anyflip.

### **Data Analysis**

The final result of the validity obtained by the validator analyzed using data analysis techniques using the formula, namely:

$$P = \frac{F}{N} \times 100 \quad (15)$$

Information :

P = Average Score

F = Total Score Acquisition

N = Maximum Total Score

Furthermore, the average score of the assessment data obtained is converted into modified descriptive quantitative data [2], [3] using the due diligence criteria (Table 1).

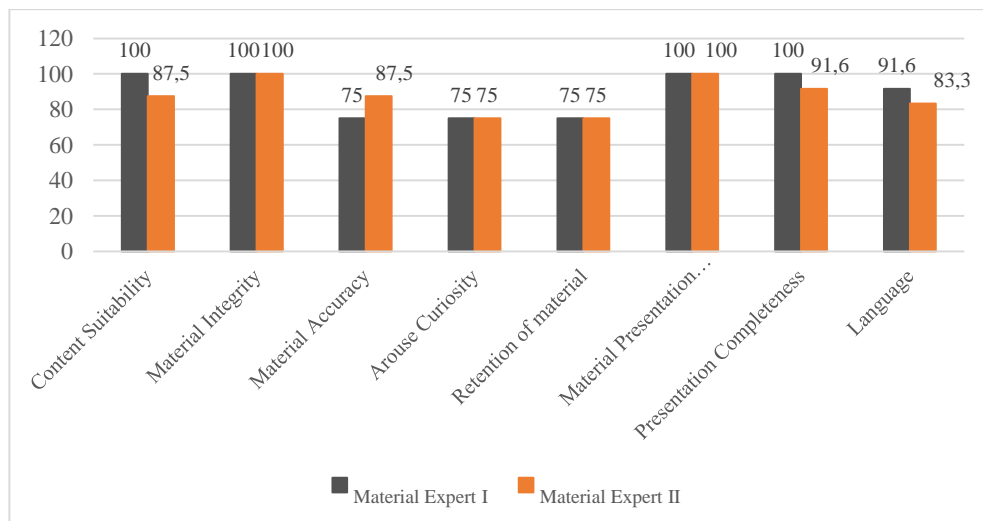
**Table 1.** Due diligence criteria *e-books*

No	Interval score	Category	Decision
1.	82 – 100	Very worth it	The product is ready to be used in the actual field for learning activities.
2.	63 – 81	Worth it	Products can be continued by adding something less and not too big and doing certain considerations.
3.	44 – 62	Decent enough	Revise by carefully re-examining and looking for weaknesses.
4.	25 – 43	Not feasible	Revise on a large scale and fundamentally about the contents of the product.

### 3 Results and Discussion

#### Validation Results By Material Expert Team

Validation by a team of material experts was carried out by two validators. The assessment of the two material experts was carried out to improve the quality of the material *e-books* which will be developed. The components of the assessment by the two material experts included content feasibility, material completeness, material accuracy, encouraging curiosity, material understanding, presentation support, presentation completeness and language we can see **Figure 1**.



**Fig. 1.** Assessment score by the material expert team

Based on the picture above, the results of the assessment analysis from material experts I obtained the overall average score of the assessment *e-books* developed by 89.5 with a very decent category. The highest average score is found in the content suitability, material integrity and presentation completeness of 100. The lowest average score is in the material accuracy component, arouse curiosity and retention of material by 75. Assessment from

material experts II obtained an overall average score evaluation e-books developed by 87.4 with a very decent category. The highest average score is found in the component of material integrity and material presentation support of 100. The lowest average score is in the component of encouraging curiosity and retention of material 75.

Overall the average score of the two material experts on e-books developed by 88.5 with a very decent category. The average score of each component of e-books. The guided inquiry-based spermatophyta sub-material developed ranged from 25 to 100. The highest average score was in the material integrity component of 100. Meanwhile the lowest average score was in the component of arouse curiosity and material understanding of 75 (Table 2).

**Table 2.** The average score of assessment by the material expert team

No	Component Assessment	Score	Category	Decision
1.	Content suitability	93,7	Very worth it	The product is ready to be used in the actual field for learning activities
2.	Material integrity	100	Very worth it	The product is ready to be used in the actual field for learning activities
3.	Material accuracy	81,2	Worth it	Products can be continued by adding something less and not too big and doing certain considerations
4.	Arouse curiosity	75	Worth it	Products can be continued by adding something less and not too big and doing certain considerations
5.	Retention of material	75	Worth it	Products can be continued by adding something less and not too big and doing certain considerations
6.	Material Presentation Support	100	Very Worth it	The product is ready to be used in the actual field for learning activities
7.	Presentation Completeness	95,8	Very Worth it	The product is ready to be used in the actual field for learning activities
8.	Language	87,4	Very Worth it	The product is ready to be used in the actual field for learning activities
	Average	88,5	Very worth it	The product is ready to be used in the actual field for learning activities

### Validation Results By Design Experts Layout

Component assessment by design experts layout includes digital biology book cover design, layout and book content images (Table 3).

**Table 3.** Average score of assessment by design experts layout

No	Assessment component	Score	Category	Decision
1.	Biology digital book cover design	97,2	Very orth it	The product is ready to be used in the actual field for learning activities
2.	Layout	95	Very worth it	The product is ready to be used in the actual field for learning activities
3.	Picture of the contents of the book	100	Very worth it	The product is ready to be used in the actual field for learning activities
Average		97,4	Very worth it	Products can be continued by adding something less and not too big and doing certain considerations

Based on the assessment of the design expert validator layout, overall the average rating score is 97.4 with a very decent category. the highest score is found in the picture component of the book content of 100 with a very decent category. the lowest score is found in the layout component of 95 with a very decent category.

### Validation Results By Learning Design Experts

Components of assessment by learning design experts include the feasibility of the content of the material, the feasibility of presenting the material and the graphics of the book (Table 4).

**Table 4.** Average score of assessment by learning design experts

No	Assessment component	Score	Category	Decision
1.	Appropriateness of material content	89,2	Very worth it	The product is ready to be used in the actual field for learning activities
2.	Material presentation	91,6	Very worth i	The product is ready to be used in the actual field for learning activities
3.	Book graphics conformity	83,3	Very worth it	The product is ready to be used in the actual field for learning activities
Average		88,0	Very worth it	The product is ready to be used in the actual field for learning activities

Based on the assessment of the learning design expert validator, overall the average rating score is 88.0 with a very decent category. The highest score is found in the Feasibility component of material presentation of 91.6 with a very decent category. The lowest score is found in the book graphic conformity component of 83.3 with a very decent category.

### Discussion

In the early stages of the research, the needs analysis stage found problems, weaknesses and conditions that became the driving force for product development. The problems found were that there were no additional teaching materials in the form of digital books, where teachers only used textbooks from schools which had many shortcomings in terms of images that were unclear and unattractive, family examples were still few, causing students to find it difficult to understand the spermatophyta sub-material. A good textbook must have correct content, use clear language and present it systematically. Textbooks that can be used as supporting teaching materials are contents that are suitable for use in the teaching and learning process

which have been designated as textbooks based on the Regulation of the Minister of National Education [11].

Flowering plants or angiosperms in Indonesia according to the data in IBSAB In 2016, there were around 30,000 to 40,000 of a total of 250,000 species worldwide (16). In this modern era, the use of the internet for education is very widespread, especially in developed and developing countries. The internet is very helpful for distance education and students can access various literature and references needed quickly, thus facilitating the learning process. The internet can also help teachers to obtain information, exchange ideas and find free simulations to complement lessons [17].

The second stage design by designing the cover, content e-books guided inquiry-based spermatophyta sub-material. The design of the cover and contents of the digital biology book for the spermatophyta sub-material using Microsoft Word. Then the format of the cover design and contents of the digital book is changed to pdf format and converted using software Anyflip. Then students will be given a link to access the book. Program Anyflip equipped with several templates. Anyflip has editing functions and multimedia objects to pages that can be flipped like a real book [1].

The next stage is to prepare instruments to test feasibility e-books guided inquiry-based sub-material biology of spermatophyta for students of SMA Negeri 3 Binjai. The instrument used is a feasibility test instrument by a team of material expert validators, design experts layout and learning design experts. The results of the assessment by the material expert validator team obtained an average score of 88.5 in the very decent category. The assessment components consist of content feasibility, material completeness, material accuracy, encouraging curiosity, material understanding, presentation support, presentation completeness and language. The material expert validator I obtained a final average score of 89.5 with a very decent category. The material expert validator II obtained a final average score of 88.5 with a very decent category.

The results of the design due diligence assessment layout obtained an average score of 97.4 with a very decent category. The assessment component consists of a digital biology book cover design, layout and contents of the book. The results of the learning design feasibility test assessment obtained an average score of 88.0 with a very decent category. The assessment component consists of the appropriateness of the content of the material, the feasibility of presenting the material and the graphics of the book.

## **4 Conclusion**

Based on the results of the validation after being revised by a team of validator experts, it was obtained 88.5 with a very feasible category where the product is ready to be used or used in the actual field for learning activities. Validation results after being revised by design experts layout obtained at 97.4 with a very feasible category, the product is ready to be used in the actual field for learning activities while the validation results after being revised by learning design experts were obtained at 88.0 with a very feasible category, where the product is ready to be used in the actual field for learning activities. Therefore, it can be concluded that development e-books Guided inquiry-based spermatophyta biology sub-material can and is

appropriate to be used as an additional learning resource for class X MIA students of Sekolah Menengah Atas (SMA) Negeri 3 Binjai.



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