Expert Assessment of Android Based E-Handout on Animal Network Structure and Function Materials

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Abstract

One of the materials that is difficult for students to understand is the material on the structure and function of animal tissues. The learning resources used by the teacher are in the form of student books and LKPD which are designed by themselves. The number of student books provided by the school is still lacking and limited, the limited number of student books is not sufficient for the number of students. So that not all students get textbooks. The purpose of this study is to produce a valid ehandout. The method of the research used the Four D model. This research was carried out until the development stage, namely the validity test. The validity test was assessed by a validator consisting of three lecturers and one teacher. The validity test conducted by the material validator, media validator and learning strategy validator on the ehandout developed was very valid. From the results of the validity test, it was concluded that the android based ehandout on the structure and function of animal tissue for class XI SMA students is very valid so that the e-handout can already be used in learning. Research advice, this research is only up to the stage of develop (development). Therefore, it is recommended for further researchers to proceed to the effectiveness stage to test the effectiveness of this Android based ehandout in the learning process.Finally, it proceed to the dissemination stage (dissiminate).

Keywords: android; ehandout; expert rating

INTRODUCTION

Teaching materials are things that are used by teachers or students to facilitate learning, increase knowledge and experience. Teaching materials are all materials (both information, tools, and texts) that will be arranged systematically, which displays a complete figure of competencies that will be mastered by students and used in the learning process with the aim of planning and studying the implementation of learning (Prastowo, 2011). Teachers are required to be able to make teaching materials in the form of written and unwritten materials. Teaching materials that can be used include textbooks, modules, handouts and worksheets. The use of teaching materials can make learning more meaningful (Teasdale *et al*., 2020; Theil *et al*., 2021). Teaching materials help students so that they are no longer fixated on the teacher's explanation. Students are free to explore their own knowledge, and then develop the knowledge they already have. In accordance with Magdalena's statement (2020) teaching materials are one of the most important parts in the learning process and are one part of teaching resources which can be

interpreted as something that contains learning messages that are both specific and general. The use of teaching materials during learning also creates a more active and communicative learning atmosphere and reduces teacher dominance during learning.

Based on the results of the author's interview with the biology teacher of class XI SMA N 1 Ampek Nagari, information was obtained that one of the materials that was difficult for students to understand was the material on the structure and function of animal tissues. The learning resources used by the teacher are in the form of student books and LKPD which are designed by themselves. The number of student books provided by the school is still lacking and limited, the limited number of student books is not sufficient for the number of students. So that not all students get textbooks, every time students learn to join their friends in learning, so students cannot study alone and repeat learning at home because of the lack of student books for students. With the above problems, in order for the learning process to be carried out effectively and achieve its objectives, it is necessary to have supporting facilities in the form of teaching materials in order to facilitate students in learning and can complete the lack of material, both in textbooks (packaged books) and materials given orally. The teaching materials used are sourced from relevant references designed according to basic competencies and learning objectives. One of the teachingmaterials that teachers can use in learning is handouts.

Majid (2011) handouts are written materials prepared by teachers to enrich the knowledge of students. Prastowo (2011) handouts are printed teaching materials that are used in learning to facilitate thelearning process. The content of the material is developed in accordance with the learning objectives and presented briefly, the advantages of the handout are that it is very economical and practical.Prastowo (2011) stated that the functions of handouts in learning include helping students not to need to record material, as a companion to teacher explanations, as student reference materials, motivating students to study harder, and reminding the main points of the material being taught (Lachner *et al*., 2022).. The development of information and communication technology allows a teaching material to be packaged in a practical and more attractive manner. In accordance with current developments, teaching materials are not only printed books but can also be in electronic form, due to the limitations of student books and the material presented in the book is still incomplete, it is necessary to develop an e-handout that can be used so that students understand the learning material.

(Princess, 2021) E-Handout is one part of the e-learning system which in the form of learning utilizes electronic media. Handouts are important in learning because they are one of the teaching materials that can be used in learning, this is in accordance with the opinion Prastowo (2011) explained that handouts are a type of teaching material commonly used in learning needs in a simple form with a very concise presentation of material, which is sourced from a collection of references that are relevant to basic competencies and the main material to be taught to students. The advantages of electronic handouts are that they are easy to carry and do not require large storage space (Gupta, 2012). Another thing that supports this e-handout research is because students are already using their own android, android-based teaching materials are considered to be able to make it easier for students to understand the structure and function of animal tissue because the teaching materials are equipped with clear images and are easy to carry and can be used. anywhere and anytime.

METHOD

This research was conducted at SMA N 1 Ampek Nagari, Agam Regency and PGRI University, West Sumatra in the academic year 2021/2022, with three lecturers and one biology teacher. This study uses a validity questionnaire, this type of research is research and development because it is carried out to develop teaching materials, namely android-based e-handouts on the structure and function of animal tissue. The development model designed in this study uses a 4-D development model consisting of 4 stages of development, namely define (definition), design (design), develop (Development), and disseminate (Deployment) due to the limited time researchers only reach the develop stage (development) (Trianto, 2012). At the defining stage, there are several steps that must be taken, including (a) front end

analysis, (b) student analysis, (c) task analysis (including content structure analysis, concept analysis, analysis of learning objectives as well as concept analysis and formulation of

learning objectives) .The design phase is carried out by preparing learning materials that will be displayed on the biology learning e-handout. This begins after learning objectives are created. This stage consists of 2 steps, namely: media selection and format selection. Furthermore, the development stage (develop) this stage aims to produce a product in the form of a valid Android-based e-handout, which is carried out by 4 validators or experts, to check the truth of the material to be discussed with aspects to be assessed, namely content validity, presentation.

Determining the highest score of the validity test:

$SM = Jv \times Ji \times St$

Information:

Sm : Maximum score

Jv: Number of validators

Ji : Number of indicators

St : Highest score

DeDDetermination of the validity value of the formula in the following:

$$Nx = \frac{jumlah\ skor\ yang\ diperoleh}{jumlah\ skor\ maksimum} \times 100\%$$

Information:

Nx: Validity

Based on the percentage obtained, then indo the grouping modified criteria like seen below:

Table 1. Modified criteria

Value Range	Validity
81-100	Very valid
61-80	Valid
41-60	Quite valid
21-40	Less valid
0-20	Invalid

RESULTS AND DISCUSSION

The results of the Android-based e-handout validity test on the structure and function of animal tissue that have been carried out can be seen in Table 2 below.

Table 2. Test Results of Android-Based E-Handout Validation by Lecturers and Teachers

No	Aspect	JS	SM	V (%)	Criteria
1	Content validity	106	110	96.4	Very valid
2	Presentation	30	30	100	Very valid
3	Graphics	44	44	97.8	Very valid
4	Language	76	80	95	Very valid
	Average			97.3	Very valid

Description: JS= Total Score; SM= Maximum Score; V= Validity

Table 2 shows an android-based e-handout validity test questionnaire on the structure and function of animal tissue by lecturers and teachers viewed on four aspects, namely content validity, presentation, graphics and language. The results of data analysis showed that the android-based e-handout was very valid with an average of 97.3%. So that the Android-based e-handout on the structure and function of animal tissue can be used in the learning process. The results of the Android-based e-handout validity test on the structure and function of animal tissue that have been carried out can also be seen in Figure 1 below.
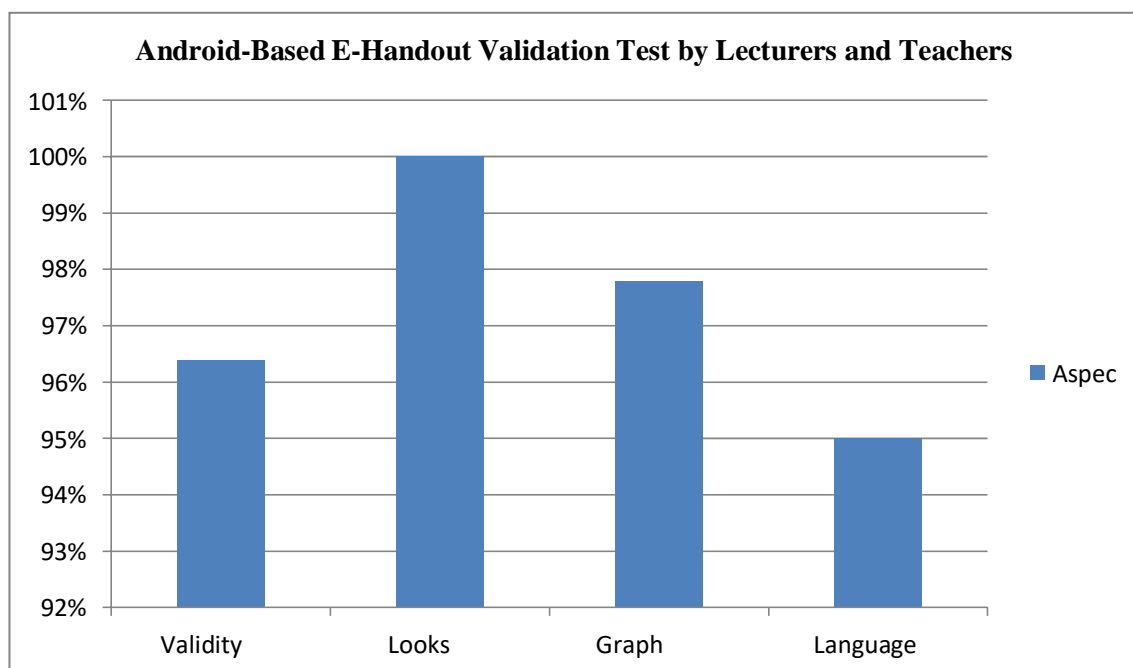

Figure 1. Android-Based E-Handout Validation Test by Lecturers and Teachers

Based on Figure 1. Judging from the content validity aspect of the Android-based e-handout, it is stated to be very valid with an average value of 96.4%. The material for this e-handout is in accordance with KI and KD, the concepts presented in the material on the structure and function of animal tissue are presented and the pictures on the e-handout contain the truth and increase students' knowledge, the material on the e-handout also has the validity of the substance of the learning material by including the names of the authors on each material discussed. This is in accordance with what was stated by (Yerimadesi, 2018) that to produce good teaching materials, teaching materials are prepared based on basic competencies and the truth of the material. Judging from the aspect of presenting an Android-based e-handout, it is stated to be very valid with an average value of 100%. This shows that the developed Android-based e-handout has been presented systematically, contains details of the material and clear learning objectives, supports the learning process, motivates, and can stimulate students. This is in accordance with the opinion (Lestari, 2018) in teaching materials there are several presentations that must exist, namely learning objectives, elaboration of material, attractiveness and relevant sources. In this android-based e-handout also presented questions for each meeting in the learning process. According to (Yerimadesi, 2018).

Judging from the graphic aspect of the Android-based e-handout, it is stated to be very valid with an average value of 97.8%. This graphic aspect is related to the display of Android-based e-handouts

which includes the display of font type and size, layout, images, attractive designs, colors and materials presented in clear writing and sizes. This is in accordance with the opinion of Hasanah (2012) that in developing a teaching material it is necessary to pay attention to the layout in the form of image display, font size and spacing. Layout can play a role in clarifying the understanding of students. Consistent with font size and typeface will also affect the comfort in reading and the use of color can make it more attractive. According to (Lestari, 2018) the use of letters in teaching materials should not be too small and should not be difficult for the reader. The typeface presented in the e-handout material on the structure and function of animal tissue is Times New Roman with a size of 16 pt because it is Times New Roman because it is a serif font (Sitepu, 2012). Judging from the linguistic aspect of the Android-based e-handout, it is stated to be very valid with an average value of 95%. This linguistic aspect relates to the use of language that is in accordance with the correct Indonesian language rules and does not cause confusion for students and the clarity of any information contained in the teaching materials. This is in accordance with what is described by Akbar (2013) that a quality teaching material must be communicative, meaning that the content of the teaching material is easy to digest, systematic, clear and does not contain language errors. Furthermore, according to Sahima (2020) that the language in teaching materials must have sentences that are easy to understand, use language effectively and efficiently, there is no double interpretation of sentences and consistent letters and pictures (Akbar, 2013; Tran, 2018). Based on the results of the analysis of the e-handout validation test of the structure and function of animal tissue by lecturers and teachers of Biology subjects with an average validation value of 97.3%. The material presented in the e-handout comes from relevant sources, and the images presented are in the form of diagrams and shapes under a microscope. The use of Android-based e-handout teaching materials can be used offline. For all aspects of validation with very valid criteria, this shows that the e-handout material on the structure and function of android-based animal tissue has met the valid criteria and can be used in the learning process.

CONCLUSION

The development of an Android-based E-Handout produces learning products that can be used as an alternative teaching material for the structure and function of animal tissue after going through a development test with the conclusion that the Android-based E-Handout on the material structure and function of animal tissue in class XI SMA/MA developed gets a score. an average of 97.3% with very valid criteria. Research advice, this research is only up to the stage of develop (development). Therefore, it is recommended for further researchers to proceed to the effectiveness stage to test the effectiveness of this Android-based e-handout in the learning process. And then proceed to the dissemination stage (dissiminate).

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