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VALIDITY AND RELIABILITY TEST OF ANDROID-BASED INTERACTIVE LEARNING MEDIA DEVELOPMENT INSTRUMENTS

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ABSTRAK

Instrumen penelitian adalah suatu alat yang digunakan untuk mengumpulkan data atau mengukur objek dari suatu variabel penelitian. Untuk mendapatkan data yang benar demi kesimpulan yang sesuai dengan keadaan sebenarnya, maka diperlukan suatu instrumen yang valid dan konsisten serta tepat dalam memberikan data hasil penelitian (reliabel). Uji reliabilitas instrumen meliputi test-retest, ekuivalen, dan internal consistency. Uji internal consistency memiliki beberapa teknik pengujian tergantung jenis instrumennya. Teknik pengujian tersebut meliputi uji split half, KR 20, KR 21, dan Alfa Cronbach. Nilai validitas dan reliabilitas suatu instrumen dipengaruhi oleh subjek yang diukur, pengguna instrumen, dan instrumen itu sendiri. Sehinggga, validitas dan reliabilitas harus selalu diuji sebelum instrumen digunakan. Dibutuhkan alat ukur validasi produk media pembelajaran yaitu berupa angket validasi media pembelajaran interaktif yang telah melalui tahap uji validitas dan tahap uji reliabilitas. Dari hasil uji validitas dari 22 pernyataan terdapat 22 soal yang dinyatakan valid serta uji validitas mendapatkan nilai sebesar 0,899 yang berarti termasuk dalam kategori excellent agreement. Dengan begitu instrumen validasi produk media pembelajaran interaktif dapat dipergunakan sebagai alat mengukur layak atau tidaknya produk media pembelajaran interaktif digunakan.

Kata kunci : validitas isi; validitas konstruk; validitas kriteria; test-retest; ekuivalen; split half; KR 20; KR 21; Alfa Cronbach

ABSTRACT

Instrumen penelitian adalah suatu alat yang digunakan untuk mengumpulkan data atau mengukur objek dari suatu variabel penelitian. Untuk mendapatkan data yang benar demi kesimpulan yang sesuai dengan keadaan sebenarnya, maka diperlukan suatu instrumen yang valid dan konsisten serta tepat dalam memberikan data hasil penelitian (reliabel). Uji reliabilitas instrumen meliputi test-retest, ekuivalen, dan internal consistency. Uji internal consistency memiliki beberapa teknik pengujian tergantung jenis instrumennya. Teknik pengujian tersebut meliputi uji split half, KR 20, KR 21, dan Alfa Cronbach. Nilai validitas dan reliabilitas suatu instrumen dipengaruhi oleh subjek yang diukur, pengguna instrumen, dan instrumen itu sendiri. Sehinggga, validitas dan reliabilitas harus selalu diuji sebelum instrumen digunakan. Dibutuhkan alat ukur validasi produk media pembelajaran yaitu berupa angket validasi media pembelajaran interaktif yang telah melalui tahap uji validitas dan tahap uji reliabilitas. Dari hasil uji validitas dari 22 pernyataan terdapat 22 soal yang dinyatakan valid serta uji validitas mendapatkan nilai sebesar 0,899 yang berarti termasuk dalam kategori excellent agreement. Dengan begitu instrumen validasi produk media pembelajaran interaktif dapat dipergunakan sebagai alat mengukur layak atau tidaknya produk media pembelajaran interaktif digunakan.

Keywords: content validity; construct validity; criterion validity; test-retest; equivalent; split half; KR 20; KR 21; Alfa Cronbach

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INTRODUCTION

The problem becomes the source of everything in a research. From the problems emerged research objectives that contain research variables. To answer the research objectives, data is needed. This data is a description of the variables studied. Correct data will lead to conclusions according to the actual situation. Whether or not the data is correct depends on whether the data collection instrument or object measurement of a research variable is good or not (Arikunto, 2010).

Whether or not a research instrument is determined by its validity and reliability. Instrument validity is concerned with the extent to which measurements are precise in measuring what is to be measured, while reliability is concerned with the extent to which a measurement can be trusted because of its constancy. The instrument is said to be valid when it can reveal the data from the variables correctly and do not deviate from the actual situation. An instrument is said to be reliable when it can reveal reliable data (Arikunto, 2010).

The validity and reliability of the instrument are not necessarily determined by the instrument itself. According to Sugiyono (2014), the factors that influence the validity and reliability of a measuring instrument (instrument) other than an instrument are the user of the measuring instrument who performs the measurement and the subject being measured. However, these factors can be overcome by testing the instrument with appropriate validity and reliability tests. Testing is done to maintain the validity and reliability. In addition, to overcome the influence of users of measuring instruments, users must improve their ability to use these measuring instruments. One more important factor that affects the validity and reliability of the instrument is the subject factor being measured. To overcome this, the researcher must be able to control the subject.

Even though an instrument is standardized and reliable, that does not directly make the instrument usable anywhere, anytime, to any subject. Instruments need to be re-tested every time they are used (Tavakol & Dennick, 2011).

RESEARCH METHODS

This study uses a quantitative approach because the expected results in this study are to show the process of calculating instrument item validation.

1. Instrument Development Stage

The instrument used in this research is a product validation test instrument. The stages of making a questionnaire for the validation test instrument for Android-based learning media products in this study are as follows.

a. Determining Product Aspects of android-based learning media

The first stage in the process of developing the validation test instrument for android-based learning media products is to determine the feasibility aspects of android-based learning media products based on the operational definition of the feasibility of the product itself. After conducting theoretical studies and analyzing aspects of learning media products based on several sources of research journals, the results obtained from the analysis of aspects of android-based learning media products (1) Content, (2) Presentation feasibility,

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(3) Language feasibility, (4) Visual Communication and (5) Use and Presentation.

b. Formulating the Instrument Grid

This stage aims to make it easier to compile indicators and validation test questionnaire statement items. The formulation of the instrument grid was developed based on the learning product questionnaire literature that had been used in previous studies. The formulated instrument grid can be seen in Table 1.

Table 1. Product Validation Test Instrument Grid

Assessment Aspects		Item Number	Number of Items
Content/content			
1	The breadth of presentation of the material	1	8
2	Depth of presentation of material	2	
3	Compatibility of pictures/illustrations	3	
4	Compatibility of the video with the material	4	
5	Use of library/reference sources	5	
6	Availability of practice questions (*quiz*)	6	
7	Providing feedback (*feedback*)	7	
8	Presentation of material summary	8	
Visual Communication and Language			
9	Use of words and language	9	9
10	Conformity with the rules of language	10	
11	The accuracy of the cover used on the media with the material	11	
12	Display quality of images/illustrations	12	
13	Video display quality	13	
14	Selection of letters in the media	14	
15	Use of design composition *backgroud*	15	
16	Election *sound effect* and background music	16	
17	Use of design, size, layout of icons/navigation buttons	17	
Use and presentation			
18	Clarity of instructions for using the media	18	5
19	Ease of use navigation	19	
20	Flexibility in the use of media for learning	20	
21	Media installation on android	21	
22	Ease of operation of media	22	

1. Instrument Validation

The next stage is the validation of the questionnaire for Android-based learning media products that have been developed based on the grid that has been formulated for 3 (three) validators. Before conducting the validation, the validator is first given a research synopsis of the description of the research to be carried out to further clarify the research questionnaire to be validated. Validity testing is done by testing the construct validity (construct validity). Construct validity testing is by asking whether the questions in the instrument are in accordance with the relevant scientific concept (Nurgianto, 2012: 339). Thus, the questions can be accounted for scientifically in their field.

Instrument validation is a measure that shows the levels of validity or authenticity of an instrument. A valid instrument has high validity. Conversely, an instrument that is less valid means it has low validity.

Instrument validity test was carried out including content validity test. Content validity was tested using expert judgment (judgment) involving 3 (three) colleagues as validators, because this judgment could increase its objectivity if it was carried out by many people. Content validity ensures that the measurement includes an adequate and representative set of items that reveal the concept, this assessment can be expressed in the Aiken form with the Aiken's V index. The validity test is used to determine the feasibility of the items in a list of statements in defining a variable. The instrument validity test was carried out on each statement item whose validity was tested. The reliability of the observation instruments was tested in the form of the Kappa test, namely Interrater reliability (Kappa Statistics) using statistical tests carried out with the SPSS (Statistics Package for Social Science) program version 16.0.

This research only reaches development, not dissemination.

2. Improved Questionnaire

During this validation stage, the questionnaire that had been previously developed was examined by the validator and then the validator provided comments and suggestions on how to prepare the correct questionnaire grid and appropriate statements for each aspect. After revising/improving the questionnaire on suggestions/comments from the three validators, the developed questionnaire for Android-based learning media products has been validated to be used in research data collection.

3. Fill in the Questionnaire Validation Sheet

The validator filled out the questionnaire validation sheet according to the suggestions/comments previously given. Filling in the questionnaire validation sheet aims to further clarify the feasibility of an interest questionnaire that will be used by signing by the validator and to obtain data that will be used to test the validity and reliability of the questionnaire for Android-based learning media products.

RESULTS AND DISCUSSION

RESULTS

a. validity

The validity of the instrument can be viewed from two aspects, namely the validity of the entire instrument and the validity of the instrument items. Analyzing the validity of the instrument can be done in a logical way and in an empirical way. The logical way of validating the instrument means that the instrument is analyzed in a rational way, namely by analyzing

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the suitability of the instrument with the material and demands of the applicable curriculum. Meanwhile, analyzing the instrument in an empirical way means that the instrument is analyzed according to experience.

In this study, the results were obtained in the form of a validity coefficient table using Aiken's V calculations.

Aiken's V validity coefficient is based on the results of an expert panel of n people's assessment of an item regarding the extent to which the item represents a construct. The formula for calculating Aiken's V validity coefficient is (Aiken, 1985)

Table 1. Results of Aiken's V statistical validation

No. Items	Indeks Aiken's	Derajat Validitas
1,3,7,10,11,13,14,15,16	0.85 – 0,90	Almost Perfect Agreement
2, 4, 5,6,8,9,12,17,18,19,20,21,22	0,70 - 0.80	Substantial Agreement

Validation results with Aiken's V show that in items 1,3,7,10,11,13,14,15 and 16 Almost Perfect Agreement and in items 2, 4, 5,6,8,9,12,17,18, 19,20,21 and 22 and shows the degree of validity of the Substantial Agreement. It can be concluded that all of these items are valid.

a. Reliability

Instrument with Interrater reliability (Kappa Statistics) using SPSS 22.0

Table 2. Reliability Results with Kappa Statistics

Reliability Statistics

Cronbach's Alpha	N of Items
,899	3

And from the results of the reliability between reters above, it shows that K = 0.899 and is included in the excellent agreement category.

The trial instrument for using interactive learning media based on Android has a total of 22 items. If it is matched with the validity classification put forward by Guilford, the trial instrument for using Android-based interactive learning media is included in the high validity category. Based on the validation results, the final instrument items are obtained which are ready to be used for testing the use of Android-based interactive learning media. The final instrument items include: a) on the Content content aspect, including: 1) the subject matter of the discussion is appropriate and still relevant to current technological developments, 2) the subject matter of the discussion traces from basic level knowledge to a higher level, 3) the subject of discussion attracts students' interest in learning, 4) the subject of discussion raises the desire of students to skip lectures; b) on the aspects of learning material, including: 5) the suitability of the material with the subject matter, 6) the level of difficulty of the

material in the learning media according to the abilities of grade VI elementary school students, 7) the material is still difficult for students to digest; c) on the aspect of learning objectives, including: 8) learning objectives are clear and in accordance with the subject matter of discussion, 9) learning objectives are able to increase student motivation to learn, 10) learning objectives still deviate from learning material; d) on the aspect of the accuracy of the file format, including: 11) learning media in the form of vieo, 12) learning media using a consistent format from one page to another, 13) learning media using a structured writing format, 14) learning media using different file formats; e) on the aspect of cover design of learning media, including: 15) The cover design uses images that are able to describe the characteristics of elementary science, 16) the cover design is able to arouse students' intentions to open learning media, 17) the cover design has followed learning media standards, 18) the coloring still contrasts between one object and another, 19) the cover design is not yet equipped with an institutional identity; f) on the aspect of interactive video design, including: 20) interactive video design using pictures capable of describing the characteristics of elementary science material, 21) interactive video design capable of arousing students' interest in installing learning media on smartphones, 22) interactive video design containing navigation which makes it easier for students to find material, 23) the format and form of writing in each interactive video image is consistent, 24) the design of interactive learning media should be equipped with the identity of the institution,; g) on the aspect of ease of access, including: 26) through the use of interactive video in making learning media in video format so that it is easy to apply to smartphone/android media.

CLOSING

This research has been going well because it has been able to obtain results in accordance with the research objectives, including:

1. has been able to provide information about the lattice of instruments used for testing the use of Android-based interactive learning media, namely as many as 22 instruments which are shown in full in table 1;
2. Has been able to provide detailed information about instrument items before being validated as shown in the table.
3. Have been able to show the results of instrument validation by using a validation test with a validation result of 0.89 so that it is included in the high validity category;

It has been able to provide information about the final instrument items used for testing the use of Android-based interactive learning media, namely as many as 22 instruments. The solution that can be taken to anticipate the main obstacles in this research is to make an instrument first requires a strong understanding of the concept/knowledge of an object being studied so that later it will be able to carry out a more in-depth elaboration of indicators based on the variables of the object under study.

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