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The development of IT-based learning evaluation media using wondershare quiz creator on the statistics course

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Abstract. The aim of this research is to produce an IT-based learning evaluation media for Hasyim Asy'ari University students, especially mathematics education study program by using the ADDIE model which consists of five stages, namely (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. The subjects include media experts, material experts, and students as media users. The research instrument used was a questionnaire of product quality filled out by students and also a validation sheet filled out by Media and Material Experts. Data processing is performed after the product data has been successfully obtained. The data is then analyzed by using the percentage formula. Through the data analysis, the percentage obtained by media expert validation was 90.36%, and material expert was 91.43%. The practicality results at the implementation phase showed the percentage of assessment was 92.27% while the effectiveness results of classical completeness was 87.36%. The results of the Validity and Reliability analysis of each item were declared valid and reliable with an Alpha value of 0.943. So, based on the eligibility criteria guidelines, overall the IT-Based Learning evaluation media in the form of the Wondershare Quiz Creator is declared worthy to be use.

1. Introduction

The target of disruption that is very prominent in the 21st century is the university institution. Universities in Indonesia are increasingly silent in Asia [1]. One of the reason is the lack of innovation in everything. Fernando states, "*innovation is always related to some practical 'in-the-world' value. It's about making new tools, products or processes, bringing forth something 'new' which allows human beings to accomplish something they were unable to accomplish previously.*" Innovation is always related to some practical values in the world [2]. Among them is how to make new tools, products, or new processes, produce something new that allows humans to achieve something they were not able to achieve before.

One thing that needs to be innovated in the education world, especially at the University of Hasyim Asy'ari, is how to evaluate students' learning outcomes. Evaluation is a process that focuses on evaluating certain activities, phenomena, situations, actions and behaviors through verbal and nonverbal means. This is a broad area of short-term and long-term of educator activities such as examining, testing, controlling, and evaluating students. The results of this activity are student evaluations, each class or group evaluation in various forms [3]. Susilowati and Ashari [4] added that evaluation of learning outcomes is a series of systematic and ongoing processes to determine the quality of learning, based on certain predetermined criteria. Globally, evaluations in educational aspects are increasingly becoming part of educational policies [5]. The education system in Indonesia explicitly regulates the need for evaluation/ assessment of students. In the Republic of Indonesia Government Regulation No. 19/2005 Concerning National Education Standards in Chapter I General Provisions Article 1 point 17 states that



assessment is the process of gathering and processing information to measure the achievement of student learning outcomes [6].

The importance of evaluating learning outcomes makes it necessary to have innovation in students at UNHAS Y especially in mathematics education study program who have been done in a classical way which is in the form of writing. Written evaluation has several weaknesses, one of which is a time efficiency. Moreover, the number of students at UNHAS Y is increased every year. The development of the modern era began to emerge applications that can be used to evaluate students' learning outcomes. One of them is Wondershare Quiz Creator 3.0. This application is an interactive media that can be used to evaluate student learning outcomes and is considered capable of suppressing the weaknesses of conventional systems today. Each application must have advantages and disadvantages. Wondershare Quiz Creator is a well-known software for questions, quizzes or test makers online, easy to use and does not require special programming skills to run it. Its use is very familiar and easy to operate, so no programming skills are difficult to operate [7].

Researchers here are interested in utilizing this application as an innovative tool that is currently still conventional at UNHAS Y, especially in mathematics education study program. Interactive media innovation in the form of evaluating teaching and learning activities as a tool for lecturers to evaluate easily, so that it can be seen what percentage of students have completed and how difficult or easy the questions are give; which means that the level of student achievement in learning is more measurable easily. Based on this explanation, researchers are interested in developing the application of Wondershare Quiz Creator 3.0 as a tool for evaluating mathematics learning outcomes at UNHAS Y especially in mathematics education study program.

2. Method

2.1. Kinds of research

This research is ADDIE development research which means a research used to produce certain products, and test the effectiveness of these products [8]. The stages of research and development are shown in Figure 1.

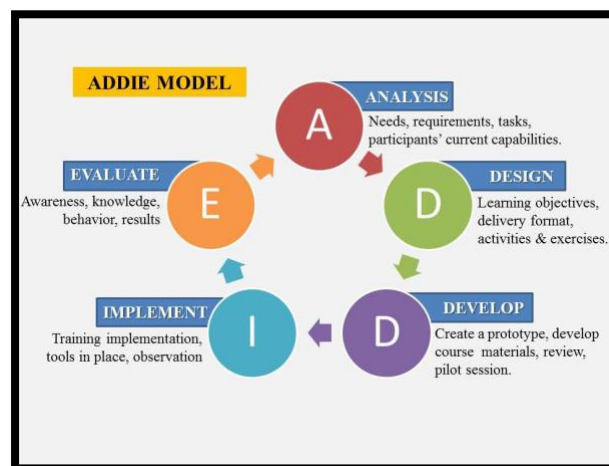


Figure 1. ADDIE Research and Development Stages

2.2. Research subject

The subjects of this study were 19 students of Mathematics Education Study Program at the Faculty of Education at Hasyim Asy'ari University, Tebuireng Jombang. They took statistical courses.

2.3. Data Collection Technique

Factor studied were in the form of development results, feasibility of evaluation programs, student responses and learning outcomes. Data obtained by questionnaire, interview and test methods. Data

analysis techniques include validity test of the instrument carried out by media experts and material experts, analysis of student responses, item validity test, item reliability test, and test distinguishing power

2.4. Data Analysis Technique

2.4.1. Analysis of instrument validity

The validator writes the evaluation on each validation sheet of the product results/ evaluation tools that have been developed. The assessment consists of five categories, namely: not good (score 1), poorly good (score 2), good enough (score 3), good (score 4) and very good (score 5). The evaluation program evaluation is carried out by a validator of media experts and material experts. The product is said to be valid if each component of the learning device gets a good enough minimum category (value 3).

2.4.2. Analysis of students' response

Practicality of the product can be seen from the student response data obtained through a questionnaire and analyzed based on percentages. The percentage of each response is calculated by the number of student responses and divided by the maximum number then multiplied by 100%. Student response is positive if the percentage of student answers for each aspect in the positive category is at least 80%.

2.4.3. Analysis of Students Learning Test Results using the Wondershare Quiz Creator

Product effectiveness can be seen from the data of student learning test results. A student is said to have finished if the student has obtained a minimum score of 70. While classical learning completeness is achieved if at least 85% of the total number of students has finished studying.

2.4.4. Analysis of Test Items carried out to get input in revising the test:

A test is said to be valid if the test measures the ability of students in learning in accordance with the stated goals. Arikunto states a test is said to have high validity if the score on the item has an alignment with the total score [9]. This alignment can be interpreted as correlation so to find the item validity, the product moment correlation formula is used [10]. The Interpretation of correlation coefficient shown as follow in Table 1.

$$r_{xy} = \frac{n \sum_{i=1}^n X_i Y_i - (\sum_{i=1}^n X_i)(\sum_{i=1}^n Y_i)}{\sqrt{(n \sum_{i=1}^n X_i^2 - (\sum_{i=1}^n X_i)^2)(n \sum_{i=1}^n Y_i^2 - (\sum_{i=1}^n Y_i)^2)}}$$

Explanation:

X = Score per item

Y = Total score

r_{xy} = Correlation coefficient of item and total scores

N = Total number of students

Table 1. Interpretation of correlation coefficient

correlation coefficient	Interpretation
$0,80 < r_{xy} \leq 1,00$	The validity of items is very high
$0,60 < r_{xy} \leq 0,80$	The validity of items is high
$0,40 < r_{xy} \leq 0,60$	The validity of items is high enough
$0,20 < r_{xy} \leq 0,40$	The validity of items is low
$0,00 < r_{xy} \leq 0,20$	The validity of items is very low

Test reliability is calculated to determine the consistency of test results. The reliability coefficient of a test can be measured using the alpha formula as follows [9]. The Interpretation of reliability shown as follow in Table 2.

$$r_{11}(\alpha) = \left(\frac{n}{n-1} \right) \left(1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right)$$

Explanation :

r_{11} = reliability

$\sum \sigma_i^2$ = total variance per item

σ_t^2 = total variance

n = number of question

Table 2. Interpretation of reliability

Reliability	Interpretation
$0,80 < r_{11} \leq 1,00$	Reliability is very high
$0,60 < r_{11} \leq 0,80$	Reliability is high
$0,40 < r_{11} \leq 0,60$	Reliability is high enough
$0,20 < r_{11} \leq 0,40$	Reliability is low
$r_{11} \leq 0,20$	Reliability is very low

In this study, the test was declared to be reliable if the reliability coefficient of the test was interpreted to be at least sufficient or highly enough [10].

3. Result and Discussion

The results of product development involving evaluation learning using the wodershare quiz creator in statistics courses are as follows:

3.1. Results of Validation of Experts

The products developed based on Media Expert judgment are in the highly valid category (Table 3). This is because the percentage of assessments given by validators is in the range of values above 85%.

Table 3. Results of a quantitative assessment of media expert validators

Aspect	Validator assessment	Score max	Percentage	Categorization
General	18	20	90.36 %	Highly Valid
Software engineering	14	15	93.33%	Highly Valid
Visual Communication	26	30	86.67%	Highly Valid
Media Design	32	35	91.43%	Highly Valid

Beside the quantitative assessment provided by the validator, the media expert validator also provided some qualitative assessments regarding suggestions for product improvement. This is in line with research conducted by Meryansumayeka [11] where the results of interactive quiz validation using Wondershare Quiz Creator were also declared valid and obtained some input from the validators especially in terms of layout and content. The following results are suggestions for product improvement (Table 4).

Table 4. Results of qualitative assessment of media expert validators

Before revision	After revision	Reasons
Music back sound used is too crowded	Music back sound is using softer sound	It is feared to disturb the user's concentration
There is no randomization in the test	Each user will do the test automatically random	Avoiding cheaters between users
Setting answer submission used submit one question at a time	Setting answer submission used submit all at once	In order, not to disturb the user's focus when working on the test

The products developed based on expert judgment of the material are in the very valid category (Table 5). This is because the percentage of assessments given by validators is in the range of score above 85%.

Table 5. Results of quantitative assessment of validators for expert material

Aspect	Validator Assessment	Max score	Percentage	Categorization
Format	9	10	90	Highly valid
Content	18	20	90	Highly valid
Language	33	35	94.3	Highly valid

In addition to quantitative assessments provided by material expert validators, the material expert validator also provided some qualitative assessments regarding suggestions for product improvement. The results of the advice given by the material expert validator as follow in Table 6.

Table 6. Qualitative assessment results of expert material validators

Before revision	After revision	Reasons
Indicators and product objectives of the evaluation tool have not been presented in the initial description	Indicators and product objectives of the evaluation tool have been presented in the initial description	So that users know the objectives and indicators of product evaluation tools used
Questions are more inclined to understand theory and only a few questions related to statistical applications in the real world	The question covers understanding theory and implementing statistics in everyday life	So that users can understand statistics in theory and practice

3.2. Student Questionnaire Results

After the development phase is carried out, the next step is the implementation phase which is carried out on the main test subjects of 19 mathematics students who take statistical courses. After being tested, the students then were asked to provide responses related to products to evaluate whether or not to revise the products. Following is the result of the student response questionnaire after using the product (Table 7).

Table 7. Results of Student Response Questionnaire

Aspect	Percentage of Positive Responses	Percentage of Negative Responses
User response to software	84.21%	15.79%
User response to IT-based evaluation tools	84.21%	15.79%
User response to Questions	94.74%	5.26%
User response to the lecturer during the evaluation process	98.24%	1.75%
User response to sustainability using IT-based evaluation tools	100.00%	0.00%
Average	92.27%	7.73%

Table 7 show that the results of student responses to the components of products that have been developed are at a positive score, this is due to the positive response of students who reach score > 80%. In addition, students have a high interest in using IT-based evaluation tools, this is indicated in the aspect of user response to sustainability using IT-based evaluation tools that 100% of students are interested in using the product again. Thus, based on the results of positive student responses (which is greater than 80%), this evaluation tool product no longer needs to be revised.

3.3. Results Validity and Reliability of Item Solved

Calculation of the validity of each test item used the product moment correlation formula. The following is a table for calculating the validity of each item

Table 8. Results of Validity Value of Each Test Item

Question Number	1	2	3	4	5	6	7	8	9	10
r_{xy}	0.929	0.929	0.819	0.929	0.771	0.929	0.929	0.608	0.819	0.606
Criterion	ST	ST	ST	ST	T	ST	ST	CT	ST	CT

Table 8 show that in general, the validity of each test item in the learning outcomes is considered valid and can be used without revision because the criteria for each test item are in the criteria of Very High, High, and High enough.

From the results of the calculation of reliability using SPSS, the reliability coefficient of the test was obtained = 0.943. This means that learning outcomes tests can be used without the need for further revisions to measure the level of student mastery of statistical courses.

3.4. Students' Test Result

After using IT-based evaluation tool products, student test results can be immediately known. From 19 students, 2 students who took the test did not complete learning because their grades were still below the graduation limit. But for mastery learning, it is classically classified as complete, because mastery learning obtained more than 85% is 87.4%. In addition, according to Muchlisin (2014) with a drill technique using the Wondershare quiz creator application can improve students' reading abilities [12].

4. Conclusion

Products in the form of IT-based evaluation tools using the Wondershare Quiz Creator have been successfully developed by using the ADDIE development model through the five stages ADDIE concluded: 1) Highly valid products are used based on material and media expert validators with the percentage of validation results of media experts at 90.36% and material experts at 91.43%; 2) Practical products to be used based on practical results at the implementation stage of product trials, show the

percentage of positive user responses that are > 80% which is 92.27%; 3) Products are also effective to be used based on student test results showing the percentage of classical completeness of 87.36%; and 4) The results of the Validity and Reliability analysis of each item were declared valid and reliable with an Alpha value of 0.943.

Based on the eligibility criteria guidelines, overall the IT-Based Learning evaluation media in the form of the Wondershare Quiz Creator is declared fit or feasible to be used.

5. Acknowledgments

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