



THE DEVELOPMENT OF BASED EVALUATION INSTRUMENTS WORDWALL FOR SCIENCE COURSES OF JUNIOR HIGH SCHOOL CLASS VII

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ABSTRACT

The evaluation instrument or evaluation tool is a tool that meets academic requirements, so that it can be used as a measuring tool or data collection about a variable. Based on the results of the analysis of the need for evaluation instruments used by educators in learning, the teacher still uses paper and google forms for evaluation. This research aims to develop a Wordwall-based evaluation instrument and to determine student responses to wordwall-based evaluation instruments. The type of research used is Research and Development (R&D). The development model used is the Borg and Gall model adapted by Sugiyono with 8 stages consisting of needs analysis, data collection, product design, design validation, design revision, small-scale testing, product revision and user testing. The results of the development of a wordwall-based evaluation instrument for class VII junior high school science subjects obtained values from the validation of material, media and language experts of 80%, 98.5% and 96.65% with very feasible categories. Whereas for the results of the trial use, the average result of the student's questionnaire response was 87.9% with the very interesting instrument category.

Keywords: instrument development; wordwall; life organization systems

INTRODUCTION

According to the Regulation of the Minister of National Education Number 20 of 2007 concerning Educational Assessment Standards, educational assessment or evaluation is the process of collecting and processing information to determine student achievement. Educators as the managers of teaching and learning activities can find out the abilities of students, the accuracy of the teaching methods that is used, and the success of students in achieving learning goals that have been set through evaluation activities.

Learning activities have changed into technology-based learning activities, especially the internet. The use of internet technology is better known as IoT (internet of thing) or IoE (Internet of everything). In addition, the 4.0 Industrial Revolution has

an impact on interaction, for example on the interaction of teachers and students, lecturers and students. This interaction, which is usually done face-to-face in the classroom, has turned into virtual interaction using various types of technology. (Vaidya et al., 2018)

In learning evaluation, it is very necessary to know the knowledge that students get in learning. Not only that, but the evaluation is also one of the determinants of the success of a learning and learning method used. (Suharsimi A, 2011). An evaluation instrument is a tool that meets academic requirements, so it can be used as a measuring tool or data collection regarding a variable. (Lestari et al., 2019) Learning evaluation instruments can be divided into two, namely tests and non-tests. The test groups include learning

achievement, intelligence tests, aptitude tests, and tests of academic ability. While the non-test group, namely the attitude scale, rating scale, observation, interviews, questionnaires, documentation, and so on. (Elis R & Rusdiana, 2017). In addition, there are several types of instruments in the form of using technology developed by several studies, such as the development of evaluation instruments using Google forms, Quizzes, Kahoot, and Webshare.

Wordwall website is a technology that can be used to evaluate learning in different ways by using an educational game. In contrast to games that are used for entertainment, educational games have a goal to achieve certain learning (Setiawan, 2015). Wordwall itself is a website that can make it easier for teachers to make quizzes or make an interesting learning evaluation. This is based on the statement (Noermanzah & Friantary, 2019) that for students to have critical, creative, cooperative, and communicative thinking skills, it is necessary to have interesting and memorable learning process such as the use of Wordwall. In addition, from the results of observations and also a questionnaire analysis of teacher needs for learning evaluation instruments at SMPN 1 Bengkulu, there are still limited teachers who use Wordwall in the learning evaluation process. The use of online-based evaluations is still limited to the use of Google Forms in evaluating and limited knowledge of teachers about Wordwall website is in the process of being evaluated which is much more interesting and practical than Google Forms.

There is still limited development of evaluation instruments that use interactive media in learning so that evaluation instruments tend not to vary in the evaluation process. Wordwall is equipped with various types of evaluations which are very interesting. Besides being based on online quizzes, Wordwall also provides quizzes that can be printed, so this evaluation is not only useful when learning online but can also be used when studying

face-to-face. Several types of quizzes that can be printed are anagrams, random wheels, drawing frames, writing frames, matchups, and quizzes. These six features can be printed and distributed to students as an evaluation tool.

This research is supported by several previous studies, namely the research conducted by Veronica et. al., et al, (2020) with the title of research on the development of web-based assessment instruments on petroleum project presentation skills with the results of the study that the developed instruments were suitable to be used to measure students' presentation skills and the developed instruments were stated to be practical to measure students' skills. in making presentations. In addition, this research is also supported by (Ayu Refsi Dewindra, 2020) entitled Development of an evaluation tool using Kahoot in Indonesian language learning for class VII students, the results of this study are that the evaluation instrument using Kahoot is feasible to use based on the results of the validator who gets an average score -average 4, 46.

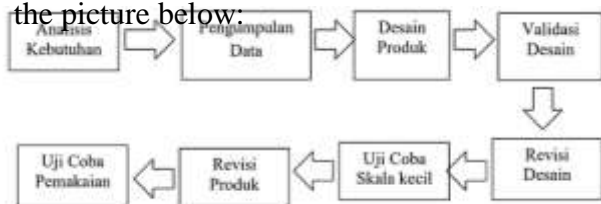
Based on some of the research results above, regarding based evaluation instruments e-learning, the researchers intend to conduct a research with based evaluation instruments e-learning but by using other instruments as a form of variation of learning instruments that can not only be used in online learning but can also be used in offline learning.

This study aims to produce a-based evaluation instrument wordwall for science courses of SMP class VII.

RESEARCH METHOD

The development model used in this study is research and development (R&D) using a development model. Borg and Gall which has been adapted by Sugiyono, the procedures for developing the evaluation instrument are needs analysis, data collection, product design, design validation, design revision, small-scale

trials, product revisions, and usage trials. A clearer research procedure can be seen in the picture below:



1. Needs analysis.
Needs analysis was carried out by distributing needs analysis questionnaires to science teachers and seventh-grade students at SMPN 01 Bengkulu City.
2. Data
The collection was carried out by analyzing syllabus, lesson plans, Ki, KD, Indicators, daily test questions, semester test questions, and textbooks used by teachers in science learning.
3. Product design
At this stage, the features that will be used on the instrument are selected and adapted to the material, the selection of an attractive template, the collection of images that will be used, and the creation of questions that will be included in the Wordwall Website.
4. Design Validation
Validation was carried out by involving 4 validators consisting of 2 material validators, 1 media validator, and 1 language validator. Validators are teachers and lecturers of IAIN Bengkulu.
5. Design revision
After the validation process, suggestions were obtained from 4 validator experts which then revised the product according to the suggestions given by the validator.
6. Small-scale trial
A small-scale test was conducted involving 10 students of class VII, this small-scale test aims to determine the advantages and disadvantages of the developed instrument. From a small-scale test, suggestions from

respondents will be obtained, which will later be used as material for revising the product.

7. Product revision
Suggestions from the results of small-scale tests are then used as guidelines for revising the instruments that have been tested.
8. Test usage.

The usage test was carried out by involving 41 respondents who were class VII students of SMPN 01 Bengkulu and 1 science teacher at SMPN 01 Bengkulu. The use trial aims to see the attractiveness of the developed instrument.

This research was conducted at SMPN 01 Bengkulu with a population of all seventh-grade students and the samples were grades VII.8 and VII.9 of SMPN 01 Bengkulu.

The data was collected by observing, distributing questionnaires, and validating material, media, and language experts. The instrument used in the study used a questionnaire with both teacher and student needs analysis questionnaires, validator questionnaires, and teacher and student response questionnaires. As for the data analysis technique, expert validation is carried out using the following calculations:

Table 1. Eligibility Criteria for Experts

Score	Criteria
5	Very Good (SB)
4	Good (B)
3	Enough (C)
2	Less (K)
1	Very Poor (SK)

The results of obtaining a validation questionnaire score can be concluded by looking at the table of criteria for the maximum score of validity which can be seen in table 2.

Table 2. Maximum Score of Eligibility

Interval	Criteria
0% -20%	Very Invalid
21% -40%	Invalid
41% -60%	Enough valid
61% -80%	Valid

81% -100% Very valid
 Addition to analysis of student questionnaire responses using the same calculation with the expert questionnaire but the attractiveness of the following criteria:

Table 3. criteria Scale attractiveness of the

average score	Classification
$0\% \leq x \leq 20\%$	Strongly Practically
$21\% < x \leq 40\%$	No Practically
$41\% < x \leq 60\%$	Less Practically
$61\% < x \leq 80\%$	Practical
$81\% < x \leq 100\%$	Very Practical

RESULTS AND DISCUSSION

The Needs Analysis

The first step in this research is to analyze the needs of the evaluation instrument. The needs analysis was carried out using a needs analysis questionnaire involving 4 science teachers at SMPN 01 Bengkulu and 10 students at SMPN 01 Bengkulu. The average results of the teacher need analysis questionnaire on the evaluation instrument shows that 50% of science learning process uses paper in the evaluation of learning and in other words some teachers conduct paper-based evaluations and some teachers use other media such as Google Forms. The result of the teacher's knowledge about the Wordwall website is 0%, which means the teacher does not know anything about the Wordwall website. The results of the attractiveness of the evaluation instrument used by the teacher to attracted students' interest in working on the questions, namely 50% and 75% of teachers needed a more practical instrument and 100% of teachers agreed if the evaluation was carried out using an instrument Wordwall.

Meanwhile, for the analysis of the needs of 10 students for the Wordwall-based evaluation instrument was found that 100% of students liked science lessons, 80% of students stated that the science evaluation of organizational system materials still used paper/manuals.

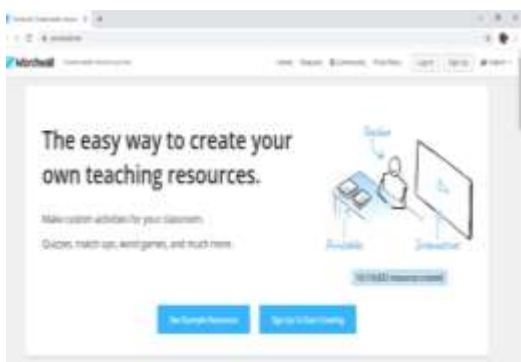
Furthermore, the students stated that in the science evaluation of the life organization system had not utilized interactive media. As many as 50% of students stated that the teacher had used other media besides paper in the science course evaluation in the form of Google Forms. In addition, students do not know about Wordwall. As many as 60% of students also stated that the science evaluation of life organization system material was carried out following the material presented. Furthermore, 40% of students stated that the science evaluation questions presented were easy to understand and attracted students' interest to work on the questions presented. 80% of students stated that they needed other evaluation media to support evaluation activities and 100% of students needed an interesting and fun evaluation instrument and students agreed if the evaluation or presentation of questions was done using Wordwall.

Data Collection

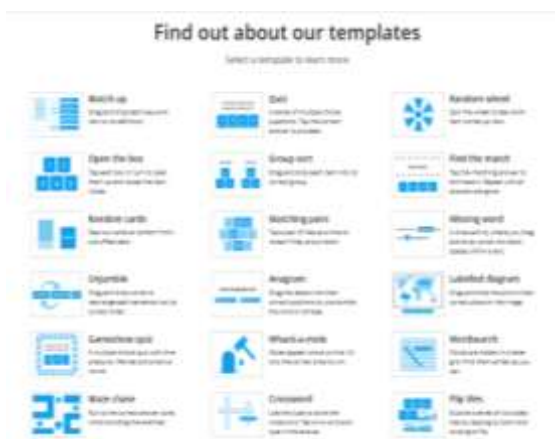
After knowing the analysis of the needs of students and teachers, then the next step is to collect data for the development of instruments, the first step is to analyze the science syllabus of SMP class VII, lesson plans, basic competencies, indicators, and learning objectives. The evaluation is carried out according to the basic competencies, indicators, and learning objectives of the life organization system. The materials needed such as pictures, and all things that support the topic to be made are sourced from the seventh grade of SMP science books, science modules, and other sources.

Product design

After reviewing and grouping the questions, the next is to assemble the initial quiz design on the Worldwall website. Making Wordwall quiz can be done by opening the website <http://wordwall.net> after that the following image will appear:



Picture 1 Initial Design Before Login



Picture 2 Types of Quiz

The Wordwall website consists of many features used in the evaluation, all features can be used free of charge and can be adapted to the tests used by the teacher. In addition, the features provided are also very interesting and fun to evaluate.

To carry out the login process, the user only needs to log in through a google account or use the user's email in the registration column that has been provided, then after that, the user will directly enter the website and choose the type of evaluation and make an evaluation.



Picture 3 Log-in Displays



Picture 4 Logged-in Displays

From picture 4, to start creating quizzes the user must click create activity, a display of types of quizzes will appear that users can use in creating questions.

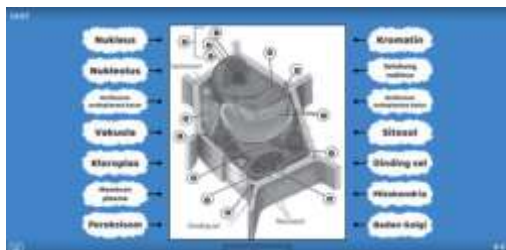
The appearance of the website has been determined by the Wordwall website, so researchers do not need to make the initial design of the website. Researchers can set the theme, time, randomization of questions, and also the leaderboard on the questions. The following are some types of question designs that the researcher will use in the development:



Picture 5 Initial Design of Wordwall-Based Evaluation Instrument Type of question Quiz



Picture 6 Initial Design of Wordwall-Based Evaluation Instrument Type of question Short Group



Picture 7 Initial Design of Wordwall quiz Type of Questions Matching the Parts of Plant Cells

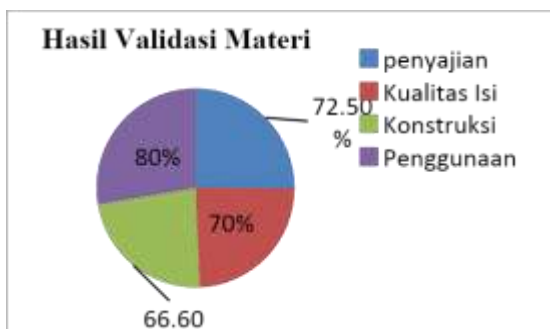


Picture 8 Initial Design of Wordwall quiz Type of Questions Matching Animal Cell Parts

Design Validation

Material Validation

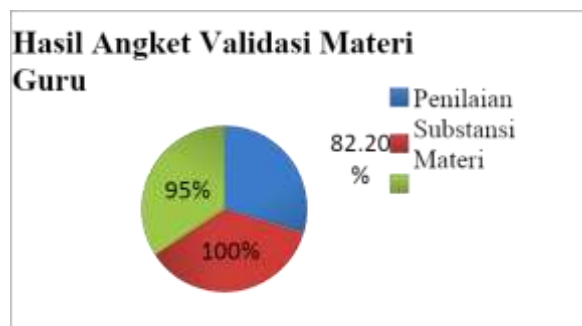
The validation of the material instrument Wordwall-based evaluation was carried out by a science lecturer at the Bengkulu State Islamic Institute and a science teacher at SMPN 01 Bengkulu. The results of the validation of the material are shown in Picture 9 below:



Picture 9. The results of the validation of the Materials for the Science Lecturer at IAIN Bengkulu

From picture 9, the score for each aspect of the presentation is 72.5%, content quality is 70%, construction is 66.6% and usage 80% thus the average percentage obtained is 72.2% which means that it is included in the interval interpretation criteria of 61% - 80% with the "Valid" category, this is in line with research

conducted by (Arnelia, 2020) which stated that the development of evaluation using e-evaluation can provide innovation in evaluating learning in which learning evaluation can be delivered interestingly and can add insight to students about the use of technology in a more positive direction. However, the validator suggests several revisions that must be improved, namely improving the quality of the content by replacing less attractive images with more interesting images, replacing options for questions that are still not good, replacing or deleting the same questions, and adding the type of question labeled diagram to the material for animal cells. The results of material validation by science teachers at SMPN 01 Bengkulu can be seen in picture 10 as follows:



Picture 10. Teacher Material Expert Validation Results

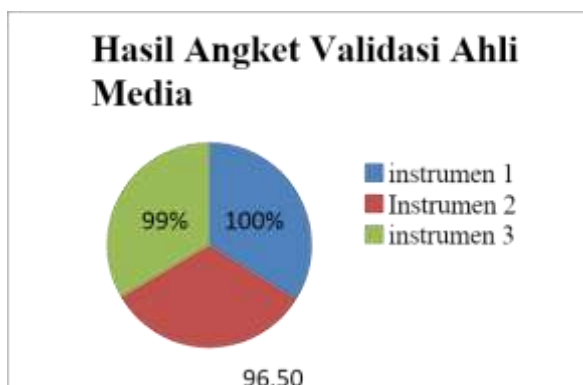
Based on a material expert validation questionnaire by science teachers at SMPN 01 Bengkulu, an assessment score of 82.2% was obtained, 100% material substance and 95% instrument design with a final percentage result of 92.4% where this percentage result is included in the interpretation criteria of 81% - 100% with the criteria "very valid" the instrument is said to be valid if the instrument applied is at range 61%. This percentage shows that the developed media can be used in accordance with the revision according to the advice of experts (Bintiningtiyas & Lutfi, 2016). However, there are some suggestions for revisions from the expert validators of science teacher related to the quality, namely improving some of the

question options, while for the linguistic questions, correcting the writing on questions that are not in accordance with the EYD (*Ejaan yang Disempurnakan*).

Media Validation

The validation of the media was conducted by a lecturer of IAIN Bengkulu

where media expert validation results can be seen in picture 11.



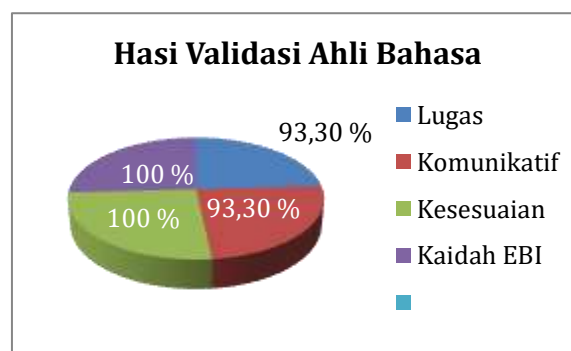
Picture 11. The Validation Result of Wordwall-Based Evaluation Instrument

Based on the results of Wordwall-based evaluation instrument questionnaires, the score of assessment instrument 1 is 100%, instrument 2 is 96.5%, and instrument 3 is 99% with 98.5% as an overall percentage which is included in the interpretation criteria of 81% - 100% with "very valid" criteria used in the learning process. It strengthen with the statement (Apriyanti et. al., 2018) which states that e-learning-based evaluation is believed to be able to assist teachers in designing a learning evaluation system because it can make it easier for teachers to check student learning outcomes and reduce the occurrence of cheating when carrying out the evaluation process. it is necessary to duplicate the question. However, some things are suggested by the validator for product improvement. As for suggestions from media experts, namely with questions that have excessive dots at the end of the questions as well as writing and pictures that must be considered again and the

pictures on the questions should be enlarged.

Language Validation

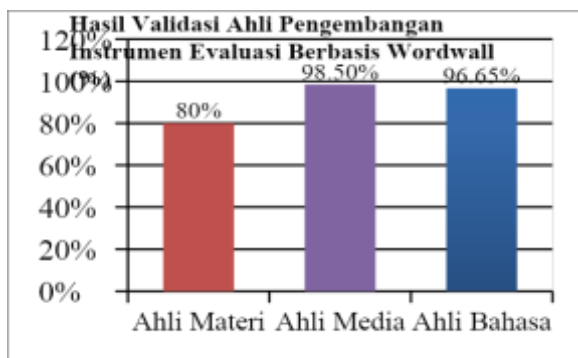
Language validation was carried out by an Indonesian lecturer at IAIN Bengkulu with the validation results which can be seen in picture 12.



Picture 12. The Language Validation Result of Wordwall-Based Evaluation Instruments

The results of the language validation questionnaire score is 93.3%, communicative 93.3%, 100% conformity, and 100% EBI Rule with validation percentage 96.65 % which fulfills the interpretation criteria of 81% - 100% in the "very feasible" category but there are some suggestions for improvement from the language validator for product revision. The advice from linguists is in the sentence in the problem by including question words for several questions in the evaluation instrument.

Overall, the results of the expert validation of Wordwall-based evaluation instruments can be seen in picture 13 below:



Picture 13. Results of the expert Validation

Design Revision

Through the validation stage, suggestions were obtained from experts were revised by researchers at the design revision stage. At the design revision stage, suggestions obtained from material experts, lecturers, and teachers are collected then the product is revised under the advice given by experts, in the material suggestions given by experts in the form of repairing questions that are still ambiguous, fixing options on questions, deleting some questions. the same or replace the question, replace the less interesting image, add grouping questions, improve writing on the questions, and add questions to the labeled diagram test category.

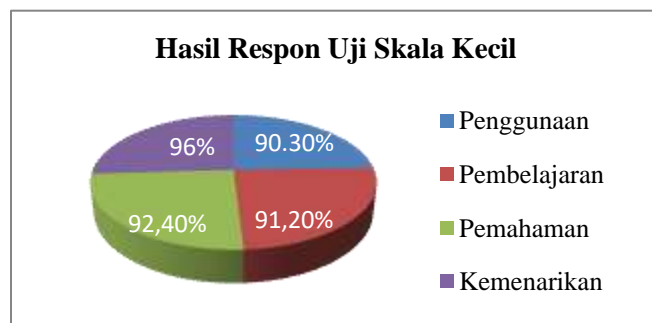
Each suggestion given by the material expert has been improved by the researcher. As for the design revision of the evaluation instrument media, there are several suggestions given by media experts, namely in writing questions that are still a lot wrong, improving the writing of questions and changing images on questions that are not quite right, and all suggestions given by media experts have been corrected in accordance with the suggestions. which is given. Meanwhile, for linguists, suggestions for improvement are given, namely using interrogative sentences on several questions, this has been corrected according to suggestions from linguists.

The Small-Scale Trial

The small-scale trial test was conducted at SMPN 01 Bengkulu with total

of 10 respondents who were taken randomly from two classes, class 7.8 and class 7.9. The taking of the number of respondents as many as 10 people are based on the statement of Borg and Gall (1989) that for the initial product field test it is recommended to be carried out in 1-3 schools with the number of respondents between 10-30 people.

Small-scale tests were conducted online where students took quizzes using the Wordwall website. After students finished working on the quizzes, the researchers would distribute student response questionnaires and students would provide suggestions on the instruments that the researchers tested. The results of the small-scale test on 10 respondents can be seen in picture 14 below:



Picture 14. Small-Scale Trial Test Response Results

In picture 14, the results of a small-scale test on the development of Wordwall-based evaluation instruments are obtained in the aspect of use 90.3%, in the learning aspect 91, 2%, the understanding aspect is 92.4%, and the attractiveness aspect is 96%. The conclusion from the small-scale test response table with an average score of 92.4% with the "very interesting" category, is in line with research conducted by Arnelia et.al (2020) that to measure practicality and attractiveness students get a percentage of 94.8 %, which means students and teachers can easily use e-evaluation using the Hot Potatoes app-based. Based on the description of the practicality and attractiveness analysis criteria, thus the e-evaluation Hot Potatoes-

based application is declared "Very Practical".

However there are some suggestions from students on the Wordwall evaluation instrument that are better to the speed to move to the next question, add pictures to the questions so that the questions are more interesting, enlarge the image size and use a more colorful background.

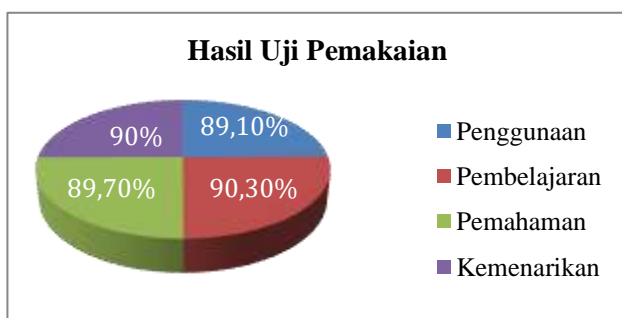
Product Revision

After conducting a small-scale test and giving a questionnaire to students, there are several suggestions for improvement to the instrument made, namely the response given by the quiz to move from one number to the next it does take a few seconds, actually students to proceed to the next question students can simply click the button next but on this suggestion, the researcher has corrected it by not making the instrument move automatically so that students are free to move to the next question manually.

The second suggestion is to add pictures to the questions and it has been corrected by adding pictures to some questions that require pictures to further clarify and increase students' understanding of the problem. As for the enlargement of the image in the problem, it cannot be fixed because the image size has been determined by the Wordwall website and the use of the instrument background has been changed to be more colorful.

Usage Test

In the usage trial involving 41 grade VII students from two different classes, the results of the usage trial can be seen in picture 15 below:



Picture 15. Usage Test Results

In picture 15, it is obtained that the final assessment of students in the development of Wordwall-based evaluation instrument obtained results on the assessment indicators, namely, usage got a score of 89.1%, learning got a score of 90.3%, understanding got a score of 89.7% and attractiveness gets a score of 90%. From the presentation results obtained from each assessment indicator, an average score of 89.7% was obtained with the "Very Interesting" criteria.

Overall, the results of the small-scale test questionnaire and usage test can be seen in picture 16 below:



Picture 16. Results of Student Response Questionnaires.

Based on the description above, it can be stated that Wordwall-based evaluation instruments are very practical to use in learning evaluation. The practicality of the evaluation instrument is the possibility of an evaluation instrument being reused by the teacher to measure learning objectives at some point in the future (Purwanto, 2010). This Wordwall-based evaluation instrument is almost the same as the evaluation instrument using Kahoot, the difference is that if Kahoot students and teachers have to install the application of Kahoot in their use while the Wordwall website is not, in the Kahoot evaluation it

cannot be printed as a printout, while the Wordwall instrument can be printed and distributed to students directly. In addition, if in the Kahoot application features used are limited, while in Wordwall it consists of many features and types of educational games that can be used in the evaluation process. This study was inspired by research conducted on the Kahoot application and the research was supported by the opinion of other studies that together with the development of evaluation instruments based on e-learning as the research conducted by (Supriatini, Refson, 2020) states that the evaluation tools of e-learning using of Kahoot are very feasible to use based on the assessment of students and educators. In addition, from the student response questionnaire, results were obtained which stated that the Wordwall-based evaluation instrument was very interesting to use in the evaluation and some students stated that the evaluation using the Wordwall website was very pleasant. This is also in line with the research conducted (Cahya Dewi, 2018) which stated that the evaluation tool was in the form of online tests using Kahoot to get responses from students with very interesting criteria and evaluation tools using Kahoot can enhance the understanding of learners.

An instrument can be valid if there is a consistent relationship between each component of the learning device developed with the characteristics of the applied learning model (Patmawati, 2016) and also a media is valid according to the terms of its relationship with the objectives of the product development itself (Nuryadi & Khuzaini, 2016). 2017)

This instrument has several weaknesses, namely the image is too small and in its use, this website requires a stable network. For that, further research is expected to develop evaluation instruments which can be used for students with unstable network conditions and also instruments that can contain images that support when using a device.

CONCLUSION

Conclusions obtained from the development of Wordwall-based evaluation instrument are as follows: The development of Wordwall-based evaluation instrument is carried out using the Bord and Gall development method which has been adapted by Sugiyono with 8 stages consisting of needs analysis, data collection, product design, design validation, design revision, small-scale trials, product revisions, and usage trials. The development of this evaluation instrument uses the Wordwall website where the questions that have been made are entered into the Wordwall website and then published to students.

The development of Wordwall-based evaluation instrument has been developed with the development stage of a test instrument. The results of product development from material experts found that the instrument developed was "very valid" used in the learning process. The first response of students' assessment of the Wordwall-based evaluation instrument got the results of a practicality test with the instrument criteria "very practical".

The development of this instrument is expected to later become one of the instruments that can be used by educators in the world of education and can assist educators in conducting evaluations more practically.

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