

POWERPOINT INTERACTIVE QUIZ AS A LEARNING MEDIA IN IMPROVING SCIENCE GENERIC ABILITY IN MATERIAL CLASSIFICATION TOPIC

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Abstract. *The development of natural science in following the pace of technology, especially in the 4.0 era, has a significant impact on learning. The application of science concepts in everyday life is important for students. This study aims to develop a Power point Interactive Quiz learning media that can help improve students' generic science skills. This development research was carried out with the research subject, namely the seventh grade students of SMP Darul Quran Singosari. Science topics used Basic competence 3.3 Classification of materials and their changes. This research uses method 4D modesl which adapted later into 3D models. Data collection techniques through observation and filling out questionnaires for students, teachers, media experts, and material experts. The resulting data are qualitative and quantitative data. The results of media validation by experts showed a percentage of 92.73% (very valid), material validation was 100% (very valid), feasibility test showed a percentage of 86.67% (valid). Then, the results of the readability test by students showed a percentage of 91.89% (very valid) and the practicality test by science subject teachers showed a percentage of 100% (very valid). The effectiveness test is in the form of pretest and posttest t-test scores with results indicating that there are differences in the results of pretest and posttest scores. So based on some of the test results, the Power point Interactive Quiz learning media is feasible and effective to be applied in learning and can improve science generic skills.*

Keywords: *learning media, interactive power point, science generic skills.*

INTRODUCTION

The development of science in following thepace of technology, especially in the 4.0 era, has asignificant impact, especially in the world of education. One of the impacts is the emergence of technology-based learning media platforms. One way to optimize technology is to apply it to the useof learning media [1]. Science subjects at the juniorhigh school level are an integration of three scientific fields, namely physics, biology, and chemistry. Science learning also emphasizes hands-on experience to help students develop and understand their environment scientifically [2]. The selection of the right learning media can certainly help in attracting students' learning motivation, consideringthat science material is known as

difficult material for students. Especially the chemistry material which is new for students because it is only presented at the junior high school level. Chemical material is inserted since the beginning of class VII in the topic of material classification and its changes. Students tend to be less able to master the concept of classifying matter based on its components such as elements, compounds, and mixtures, as well as in distinguishing changes in material that occur [3].

In the results of research that has been done,it was found that there were students' difficulties in mastering the material and its characteristics. There is a need for learning media that can assist in delivering material that is classified as abstract such as elemental material, compounds, and mixtures [3].

Learning media is a tool that can convey messages in various ways, able to stimulate students' thoughts, feelings, and desires so that they can maximize the realization of the teaching and learning process to add new insights to students [4]. Through learning media the achievement of learning objectives will be easier to take.

The choice of power point as a learning medium has also become a target for educators.. Power point is the most frequently used presentation medium by educators. The process of operating PowerPoint is also not so complicated that it can be used by all educators [5]. However, not all the features in the PowerPoint application have been used optimally. At this time making power point is still simple and less interactive [5]. Online learning at the time of the current pandemic which is a difficulty for teachers to present material, then this PowerPoint media can be one solution [6].

Generic science skills are skills that can be used to learn various concepts and solve various problems, especially those related to science. Training students' generic abilities needs to be done from the beginning of education. The lack of generic science skills of these students can result in a lack of students' ability to apply science to solve problems in everyday life [7]. Based on research that has been done previously, the average percentage of students' generic science abilities is still low. One of them is mentioned in the research of Rosidah et al (2017) which states that the average percentage of students' science generic abilities is 65% [8]. In addition, in another study conducted by Yuliyanti et al (2016), it was stated that the students' generic science abilities were only 45% on average. So that the application of generic science skills still needs to be improved [4]. In addition, in the development of this learning media, the aspects of the applied science generic skills focus on problem analysis skills. This aspect was chosen based on the results of previous research that the lowest aspect of science generic skills is logical inference with a large percentage of only 33%. One of these logical inferences is the ability to analyze problem solving [9].

From the description above, the urgency that underlies this development research, namely learning media that can improve the generic ability of science needs to be developed.

This is due to the low level of generic science skills possessed by students, especially in the aspect of problem analysis. So with the development of interactive power point quiz learning media, it is hoped that it can help improve students' generic science skills. The author uses Microsoft Power point software as an interactive learning media that can train students to further improve their generic science skills. Or if the purpose of this development research is elaborated, namely to develop an interactive learning media and to test the feasibility of interactive power point quiz learning media in improving students' generic science skills. This is also based on the problems that need to be answered in this study, namely as follows.

1. How to develop a interactive power point quiz learning media that can help students to improve their generic science skills?
2. How is the feasibility and effectiveness of the interactive power point quiz learning media on the topic of material classification as a solution in improving students' generic science skills?

METHOD

In the development research, the approaches used are qualitative and quantitative research. Qualitative research explain to describe the results of media development on student's abilities. The components in qualitative research refer to the results of the feasibility and readability tests carried out by experts and research subjects. The quantitative component refers to the results of increasing students' pretest and posttest scores and the percentage of product validation results. This research is a type of development research using the 4D development model. This model is one of the learning system design models that shows the basic stages of learning in a simple and easy way to learn.

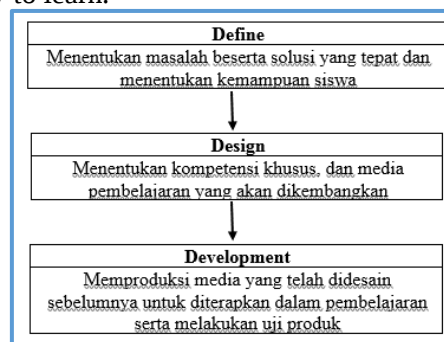


Figure 1. Research Procedure [10]

This model has four phases in its implementation, namely *Define*, *Design*, *Development*, dan *Disseminate*. but due to limited research time, this model was adapted to 3D namely *define*, *design*, *development*. Based on this procedure, the first step is to *define* the stage by carrying out data retrieval analysis of students' initial needs to determine the abilities or competencies that need to be improved. The instrument used is a questionnaire for students and teachers. The next stage is design to determine the design of learning media that will be developed by compiling it in a storyboard. Then the *development* stage which includes activities to create or modify teaching media to achieve predetermined learning objectives. Themaking of the teaching media is adjusted to the goals or outcomes that are expected to be realized in students. At this stage, an expert test will also be carried out on the developed learning media. There were two expert tests, namely media and material experts. Then for the test of readability, practicality, and effectiveness carried out by students and teachers of science subject.

The product validity test was conducted on media and material expert lecturers. Meanwhile, the practicality test was carried out by the science subject teacher and the readability test was carried out by the seventh grade junior high school students. In media and material validation, feasibility test, readability test, and practicality test used a scale Likert uses a score of 1 to 5 with the following scoring criteria [11].

Table 1. Likert Scale Scoring Criteria

Score	Information
1	Very inappropriate
2	Inappropriate
3	Not Suitable
4	Suitable
5	Very suitable

This feasibility test was carried out to produce data on whether the interactive media developed was theoretically feasible and suitable for use in the learning process. Then the practicality test is carried out to test whether the development product is practical and easy to use by users. Not only that, a readability test was also carried out to find out whether the language, material and layout of the textbooks

could be used by students to understand the material in them [3].

As for the validation of the truth of the concept of the material presented, the Guttman scale is used with the following scoring criteria [12].

Table 2. Guttman Scale Scoring Criteria

Score	Information
1	Right
0	Wrong

Then to calculate the percentage which is calculated as follows..

$$\text{Percentage} = \left(\frac{\sum x}{\sum x_i} \right) 100\%$$

Information:

Percentage = eligibility percentage

$\sum x$ = total score of evaluator's answer

$\sum x_i$ = highest total answer

Furthermore, in determining the level of product validity, assessment guidelines are used as a benchmark in revising the learning media. The criteria for this level of validity consist of five categories, namely very valid, valid, quite valid, less valid, and invalid. Or if it is translated along with the percentage, it is as follows [10].

Table 3. Criteria for validity level

Percentage (%)	Validity Level	Information
90 – 100	Very valid	Very suitable
80 – 89	Valid	Suitable
65 – 79	Quite valid	Not suitable
55 – 64	Non valid	Inappropriate
0 - 54	Invalid	Very inappropriate

Then to test the effectiveness of the students' pretest and posttest scores, statistical calculations were carried out using the t-test so that it could be seen whether there was a difference between the data obtained from the students' pretest and posttest results. The t-test used is the *paired sample t-test* by utilizing the SPSS Criteria. The decision-making criteria in the paired sample t-test is that if the significance value is < 0.05 , then there is a difference in the data sample being tested. Then if the significance value is > 0.05 then there is no difference in the tested data sample [13].

RESULT AND DISCUSSION

This development research produces a product in the form of Interactive Power point learning media Quiz on the topic of material classification to improve students' generic science skills. This media was developed using Microsoft Power point software which is quite often used in learning. The advantage of this learning media is that it optimizes the use of trigger, hyperlink and animation features in PowerPoint, which so far have not been explored. The trigger and hyperlink features are very useful in making interactive quizzes in this learning media. The following is a learning media design that has been developed.



Figure 2. Menu page and Media Quiz Power point Interactive Quiz

In this learning media, besides providing interactive quizzes, there is also preliminary material that can be used as literature for users, especially students. Some of the quizzes that are displayed are based on problems or cases that occur in everyday life. So that it can train students to think critically and analytically in doing the quiz provided. Through the application of science concepts in solving problems or cases, it can be a means to train students' generic science skills. Thus, through the Power point Interactive Quiz learning media, it is hoped that it can help students better understand the concepts of the material and can improve students' generic science skills. The menus provided in the learning media are as follows:

a) Learning media

In this section, explanation materials related to the topic of KD 3.3 Class VII will be

provided, namely the Classification of Materials and their Changes. For essential materials, it includes the classification of matter (elements, compounds, mixtures), methods of separating mixtures, properties of substances, and changes in substances. Sources of material are taken from student books published by the Ministry of Education and Culture, student handbook modules, as well as sources from the internet that are relevant and reliable.

b) Quiz

In this section, 20 quiz questions will be provided with a variety of question models such as multiple choice, matchmaking, and word sorting. The types of questions provided consist of concept questions and application cases/problems. Later students will immediately know the truth of the answers that have been done by students.

After developing learning media, the product is then tested both in terms of media, material, and practicality. Based on the results of data collection in the form of media and material validation by experts, practicality tests by science subject teachers, and readability tests by seventh grade junior high school students can be described in the following table.

Table 4. Recapitulation of Research Result Data

No	Indicator	Score	Information
1	Media validation	92,73%	Very valid
2	Material validation	100%	Very valid
3	Feasibility test	86,67%	Valid
4	Readability test	91,89%	Very valid
5	Practically test	100%	Very valid

Based on the data from the media validation results, it can be seen that the Power point Interactive Quiz learning media obtained validation results with very valid and valid predicates. The information was obtained based on the criteria for the level of validity used in this study. Then in the readability test, students were given a questionnaire in the form of student assessments of the *Power point Interactive Quiz learning media*. Then in addition to the readability test, an effectiveness test was also applied by conducting a pretest and

posttest on students to determine the resulting improvement. In its implementation, it is carried out in accordance with the learning plan (RPP) that has been prepared. Where before the implementation of the learning media, pretest questions were given to students. Pretest questions are given to measure students' initial abilities.

After that, students get the material and do interactive quizzes that have been presented in the learning media. Then after the implementation of the media, posttest questions were given to students to measure students' final abilities. The pretest and posttest questions provided are five questions which are composed of types of analytical questions in the form of application in life, so that in doing so students need generic science skills in the form of problem analysis aspects.

The provision of pretest and posttest aims to determine the increase in students' generic science abilities after the application of interactive power point quiz learning media. Based on the results of the students' pretest and posttest scores during the implementation of the Interactive Power point Quiz learning media, the following data were obtained.

Table 5. Pretest and Posttest Data Recapitulation

Category	Number of Questions	Class average
Pretest	5	40
Posttest	5	79

The results of the calculation of the student's average score for the pretest and posttest showed an increase. From the results of the pretest and posttest scores, parametric analysis was also carried out using a t-test with SPSS which resulted in the following data.

Table 6. T-Test Data Results

	Std. Deviasi	t	Sig (2-tailed)
Pair 1			
Pretest-Posttest	14.445	-12.693	.000

Based on the results of the T-test, a significant value was obtained, namely 0.000 where the value was <0.05 . So that according to the decision-making criteria on the t-test stated by Esti and Irul in their book (2017), it was found that there was a difference between the

students' pretest and posttest scores. Based on this description, it can be seen that the Interactive Quiz Power point learning media is feasible to be applied in junior high school science learning according to the product validity results. In addition, based on the results of the t-test which stated that there was a difference between the pretest and posttest scores, this learning media was said to be able to improve students' generic science skills related to aspects of problem analysis in everyday life by applying scientific concepts

CONCLUSION

This research uses 3D models for the first step is to *define* the stage by carrying out data retrieval analysis of students' initial needs to determine the abilities or competencies that need to be improved. The next stage is design to determine the design of learning media that will be developed by compiling it in a storyboard. Then the *development* stage which includes activities to create or modify teaching media to achieve predetermined learning objectives. The development of interactive Power point Quiz learning media can improve students' generic science skills based on the t-test results of students' pretest and posttest scores. Then the results of media validation by experts showed the percentage of 92.73% (very valid), the validation of the feasibility of the material showed the percentage and 86.67% (valid), and the validation of the validity of the concept was 100% (very valid). Then the results of the practicality test by the science subject teacher showed a percentage of 100% (very valid) and the results of the readability test by students showed a percentage of 91.89% (very valid). From these research, it can be said that the power point interactive quiz learning media is feasible and effective to be applied in junior high school science learning.

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