Analysis of Teachers and Student Responses to Android-based Chemical Bonding Learning Media Using Smart Apps Creator Program

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Abstract . This research aims to perceive student responses to chemical bonding android base teaching media using smart apps creator. To achieve the objective, the development research was carried out using the 4D model and conducted in SMA Negeri 5 Medan. Student responses data was taken from calculating the value of the response questionnaire given by the researcher to students. The results shows (1). The results of interviews with teachers show that to teach Chemical Bonding topic Android-based learning media is needed. (2). An Android-based Chemical Bond learning media has been obtained using the smart apps creator program with 7 feature specifications, namely main view, main menu, kearning material, evaluation, summary and references. (3). The lecturers and chemistry teachers gave very good responses and assessments of the Android-based chemical bond learning media obtained.(4). The Class X students of SMAN 5 Medan gave a good perception with an average rating of 82.6%.

Keywords: Teacher and student response; android-based learning media; Smart apps creator.

1.Introduction

One thing that is essential and significant is education. People will find it simpler to have a stable future, land the ideal job with ease, and have a good career and job by having a good level of education. People will therefore be able to govern the future intelligently with education. Particularly at this time, available employment opportunities will select candidates based on the schooling to date [1]

Education is the term of the concept of education in English; its Latin etymological source is Eductum. E, which signifies development from the inside out, and Duco, which means to develop, make up the word "eductum." Therefore, etymologically speaking, education is the process of honing one's own skills and personal assets [2]

Learning is a human process that helps people develop various competencies, skills, and attitudes. The ability to learn is a key feature that distinguishes humans from other living

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things. Learning can also be interpreted as an effort to gain intelligence or knowledge. Changes in behavior (changes in behavior) characterize learning[3]. The learning process is a communication activity in which ideas, ideas, and subject matter are delivered between teachers and students so that mutual interaction occurs. Learning media that can assist students in learning activities and educators in learning and carrying out their duties are required to achieve a good learning process. One of the subjects taught in high school is Chemistry[2]. One of the developments in information technology in the world of education is the creation of learning media. Therefore, the world of education must be able to utilize technology to create multimedia-based learning media that are more interesting, interactive and comprehensive [4, 5]
Chemistry is a science that is always developing along with technological advances. its nature is abstract, interconnected and requires high level thinking skills in its application. Some students have difficulty understanding chemistry because it is a subject that has facts, procedures and concepts, and problem solving[4]. Apart from that, chemistry subjects aim to enable students to have the ability to understand the laws, principles, concepts and theories of chemistry and use them in solving everyday life problems [6, 7].
One of the sciences that is expanding quickly in tandem with the advancement of technology and its use in daily life is chemistry. Students' understanding of the ideas, laws, principles, concepts and theories of chemistry, as well as how they relate to one another and how to use them to solve issues in technology and daily life, is the goal of the chemistry lessons taught in SMA/MA. Chemistry is a subject where most of the concepts are abstract and demand a high degree of reasoning to comprehend. In addition, chemical concepts frequently relate to one another, which can be challenging for some students to understand [2, 3].
Based on learning observations at SMAN 5 Medan, there are still issues with low student interest in learning that impede student achievement in chemical bonding material. Teachers' abilities in using learning media and level of difficulty of the material are two factors that contribute to students' disinterest in learning. Teachers' learning media are still traditional, making the learning process monotonous and boring for students. Furthermore, many students are already using smartphones for purposes unrelated to the learning process, such as social media (Facebook, Instagram, Line, and WA) and gaming. This will disrupt students' learning concentration and decrease their interest in viewing textbooks. Students will prefer to stare at their smartphone screens, causing them to focus more on their smartphones, leading to addiction [3, 8].
Researchers can provide alternative solutions to the following problems by developing learning media that are easy to use, informative, interactive, and interesting for students. E-modules, websites, and android-based applications are examples of learning media. Currently, researchers will use Smart Apps Creator software to create android-based learning media. The researcher chose Smart Apps Creator because it is simple to use and allows for the correction of mistakes in media preparation. Furthermore, the application can be used offline, so students do not require a data package to use it. With the advancement of technology in Gen Z in modern times, this android application-based learning media is becoming more popular [9].
Related research on the development of android application-based media can be found in the research of Isma and Jaslin, who concluded that the android-based chemistry learning media materials in buffer solution and hydrolysis materials that have been developed are suitable for use in learning in terms of material assessment aspects including good criteria, media assessment aspects including very good criteria, and student test results are included [10].
Related research can be found on the resend study, which concluded that in the chemistry learning process, teachers never use android-based learning media. As a result, Android-based interactive media is required in the learning process to improve students' comprehension [11].

2.Methods

2.1 Materials/ Sample and Population

This research is classified as Development Research based on the goals an objectives with the goal of discovering, developing, and validating a product. The population of this study were all students of class X MIPA at SMA Negeri 5 Medan. In this study, the sample was taken using a purposive sampling technique, where the teacher directly determined the sample to be studied. Based on the technique used, the sample to be taken is 1 class, namely class X MIPA 4.

2.2 General Procedure

In this study, research and development techniques were combined with 4-D research methods This research and development design seeks to create products that will help students learn more effectively. The 4-D model was chosen for development because it is the recommended model for developing learning tools. The following is an example of a 4D model [11]

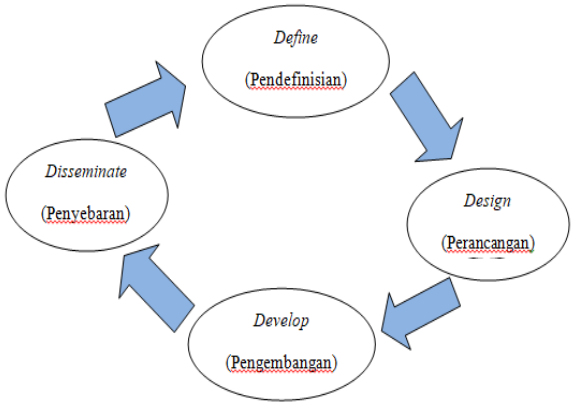

Figure 1. The 4D Model on to prepare smart apps creator program android based media [4,11].

a. Define stage, this stage aims to define the needs analysis in the learning process as well as the limitations of the material to be developed
b. Design stage is divided into several activities, namely: media selection, format selection. Activities carried out at each stage include: (1) selecting appropriate learning media (2) selecting appropriate learning media.
c. Development stage,the objectives at this stage are: expert assessment and development testing.
d. Disseminate stage divided into three activities, namely: validation testing, packaging, diffusion and adoption

   The data collection in this research used non-test instruments. It used to analyse the feasibility of android based media and determine student interest learning. Non-test instrument included : (1) Interview, this interview with the chemistry teacher aims to observe learning in the classroom including the applicable curriculum, student characteristics, school facilities, learning methods and media used. (b) Questionnaire, the distribution of this questionnaire was carried out to see students' interest in learning before and after using android application-based learning media in chemistry subjects,

especially in chemical bonding material and carried out to see the students' responses to the developed learning media.

2.3 Data Analysis

The data analysis technique used in this study is qualitative. Qualitative data consisting of a media suitability assessment sheet by the validator, a questionnaire sheet on student learning interest and a questionnaire sheet on student responses to learning media. Data were obtained before and after going to the field to apply learning media at the product distribution stage. All information is analyzed according to portions and used as a reference for improving learning media. Feedback and criticism will be used as guidelines for improving or revising the developed learning media[11].

3.Results and Discussion

This research and development resulted in a product in the form of Android-based learning media on the topic of chemical bonds, which is named Chemical Bonds. With the 4D development model, namely: (1) definition, (2) design, (3) development, and (4) disseminate. However, in writing this article, the researcher only included the results of studies that had been published up to the design stage so that it could be explained clearly how the process of creating Android-based chemical bond learning media was carried out using Smart Apps Creator program[11].

3.1 Define Stage

At this step, need assessment was done in the forms of needs analysis, analysis of the learning materials, and analysis of the environment. (1) Needs analysis, which seeks to determine which end product will best meet the needs. The researcher conducted a face-to-face interview with Chemistry teacher at SMA Negeri 5 Medan, and asked them 11 questions. Table 1 displays a study of the evolution of educational media that was done after discussion with chemistry teachers[4,5].

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Table 1. Results of interviews with teachers regarding the need for chemical bond learning media

No	Question	Answer
1	At this time what curriculum is implemented at SMAN 5	The curriculum currently used at SMAN 5 is K13.
2	In the learning process, what learning media do you use?	The learning media that I use are textbooks.
3	Is the media effective enough in the learning process Ma'am?	In my opinion it is less effective, based on my observations there are still students who still do not understand the material that I convey
4	Did SMAN 5 already have Android application-based learning media on chemical bond material ?	Not yet, so far the media used are only textbooks and internet from cellphones
5	Do you have an student worksheet (LKPD) for learning chemical bonding ?	Starting from the pandemic, I didn't use LKS (Student Worksheets) so for now I'm providing practice questions from the questions available in the textbook

6	What method do you use when learning chemical bonding ?	For learning chemical bonds I use the lecture method, where I explain theory from the front and if there are students who don't understand the material after I explain, I can ask questions and also students are given assignments as exercises in class and at home.
7	What is students' interest in studying chemistry?	Student interest in learning is still small because many students find it difficult to understand chemistry lessons so they tend to open their cellphones or chat with their friends rather than take part in learning.
8	What are the student learning outcomes in chemistry lessons.	For learning outcomes there are still some students whose grades are incomplete or below the KKM.
9	Based on the information that you gave, I intend to develop learning media based on android applications on chemical bonding material. What do you think?	I think it's very good because so far there is no learning media based on android applications and later with this application it can make it easier for me in the learning process

As seen in Table 1 above, students interest in learning chemistry, Chemical bonding,remains low. The teacher notices that the learning media used in learning process only used textbook . Teachers' learning media are still traditional, making the learning process monotonous and boring for students. Furthermore, many students are already using smartphones for purposes unrelated to the learning process, such as social media (Facebook, Instagram, Line, and WA) and gaming. This will disrupt students' learning concentration and decrease their interest in viewing textbooks. Students will prefer to stare at their smartphone screens, causing them to focus more on their smartphones, leading to addiction. Alternative solutions to the following problems by developing learning media that are easy to use, informative, interactive, and interesting for students. Android-based applications are examples of learning media. The advantage use of Smart Apps Creator is simple to use and allows for the correction of mistakes in media preparation. Furthermore, the application can be used offline, so students do not require a data package to use it. With the advancement of technology in Gen Z in modern times, this android application-based learning media is becoming more popularTo measure student interest, the distributed questionnaire consisted of 2 statements. The research instrument uses a Likert scale, namely giving scores of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree). Table 2 shows the questionnaire results in terms of measuring student interest. The table gets an overall percentage of 80.1% of students consider chemistry lessons difficult is due to abstract concepts, many calculations of chemical formulas that are difficult to understand and the learning media used by teachers is considered monotonous. This is the same as what was revealed by the teacher based on interviews that most students had difficulty understanding concepts and calculating chemical formulas, one of which was the subject matter of chemical bonds.

Table 2. Result of the questionnaire interest in learning

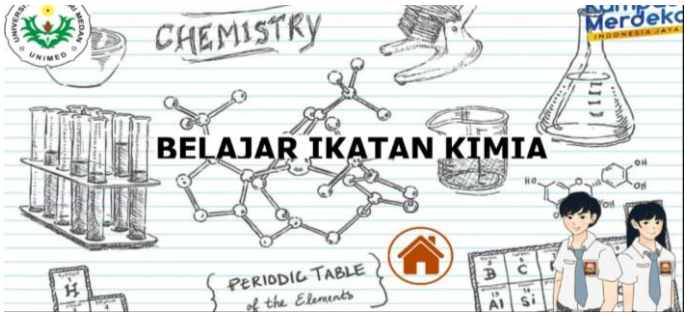
I'm bored following chemistry lessons	**Percentage**

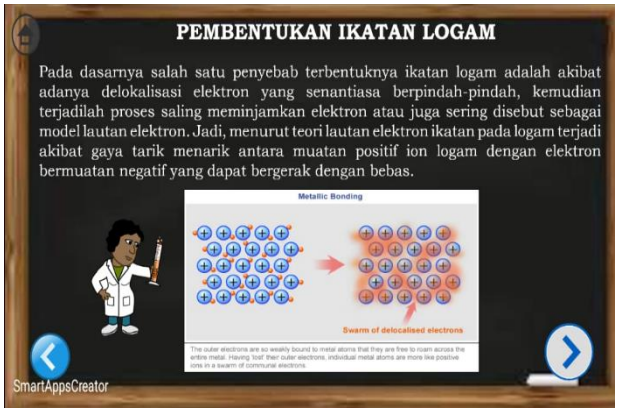
Strongly Agree	6,7%
Agree	63,3%
Disagree	20%
Strongly Disagree	10%
I have a hard time understanding chemistry problems	**Percentage**
Strongly Agree	10,1%
Agree	70%
Disagree	13,3%
Strongly Disagree	6,6 %

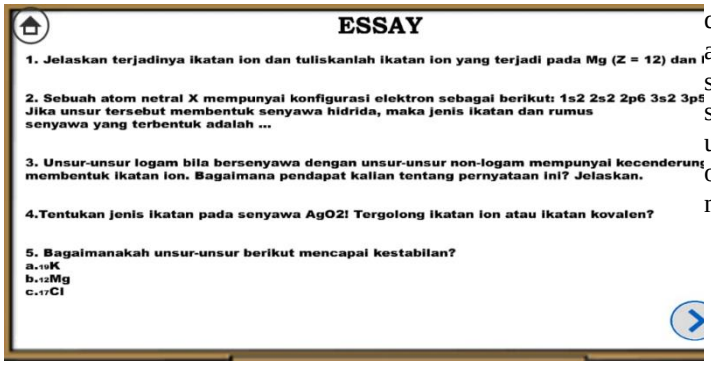
3.2 Design Stage

At this stage the researcher designed the learning media based on android applications and hold discussions with supervisors, chemistry teachers at SMA Negeri 5 Medan. The results in this stage are storyboards. The resulting product is in the form of android application-based media. Furthermore, the results of the development of learning media products based on android applications chemical bond material were successfully developed with the help of smart apps creators as applications for making android applications. Users can access this media via share via whatsapp. Following design of android application-based learning media which can be seen in the Table 3

Table 3. Feature of chemical bonding teaching media with smart apps creator program.

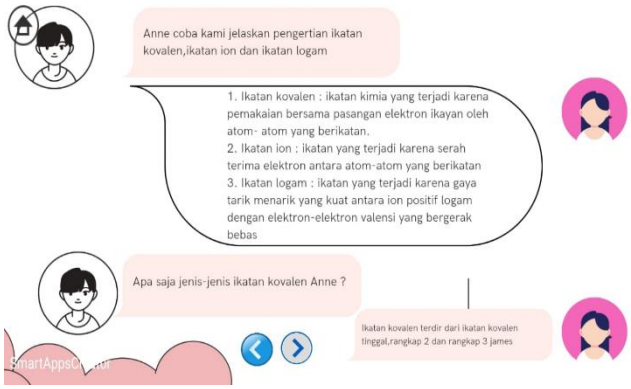
Nu	Story Board	Information
1	Main View 	Main view is the initial appearance of mobile learning media. The front cover consists of the title of the material, the learning base used, pictures related to chemistry
2	Main Menu 	Main menu is a display that contains several main menus for practice questions, essays and summaries.

3	Learning material		Learning materials consist of learning objectives, explanations of the formation of covalent, ionic and metal bonds along with examples of questions on each topic. In each material there are learning videos and sample questions to broaden students' insights in understanding the material. The addition of pictures, moving animations, videos, and so on aims to enable students to be more interactive and not feel bored with the features available.
4			Practice contains 10 multiple choice type questions with a discussion after students answer all the questions.
5	Evaluation		The evaluation contains 10



questions that aim to strengthen students' understanding of the learning material.

6 Summary



The summary menu contains conclusions about all the learning materials contained in the application.

7 References

The references contains references to the source of subject matter contained in mobile learning media)

3.3 Development Stage

The develop stage aims to produce mobile learning media products that have a valid or good feasibility level. The results of this stage are intended as input for the creation of feasibility of learning media based android application.

a. Lecture and teacher response

On this stage, lecture and teacher chemistry as expert give assessment according to feasibility level of android base media which has been produced. These expert consist of 3 Chemistry Lecturer at Universitas Negeri Medan, and one Chemistry Teacher at SMA Negeri 5 Medan. The provision of a feasibility assessment of learning media products by experts is guided by expert validation instruments that have been made by researchers consisting of assessment component indicators. The instrument has been given input and approved by the supervisor to be given to the expert validator. At this stage the expert validator also provides suggestions for improvement beforehand to be revised by the researcher, after the revision is carried out in accordance with the suggestions for improvement then the expert validator provides an assessment of the feasibility of the media product.

Table 4. The results of the feasibility test by the material and media expert

Nu	Validator	Average Score Validator	Percentage
1	Validator I	3,40	85%
2	Validator II	3.43	85%
3	Validator III	3,43	88%
4	Validator IV	3,40	85%
Average		3,41	85%
Information		Quite Valid	

The percentage of the assessment results of the validation of media experts and material experts using the Likert scale is found in the classification "Quite valid " according to the table of validity criteria[6] .

Table 5. Table of media validity level criteria

Nu	Achievement Percentage	Validity Classification
1	85,01% - 100% (A)	Very valid, or can be used without revision
2	70,01% - 85% (B)	Quite valid, or can be used with small revion
3	50,01% - 70% (C)	Not valid, recommended not to use because its major revision
4	01,00% - 50% (D)	Invalid, or can't be used

Based on table 4, the conclusion from the results of the feasibility test by the material and media expert validator is that learning media products based on android applications are declared quite valid, so they can be used as learning media.

3.4 Disseminate Stage

The dissemination stage of Android application-based learning media is carried out via WhatsApp. After the activity ended, students were given a response questionnaire to the Android application mobile learning media. Following are the results of the student response questionnaire on the feasibility of learning media products based on Android applications shown in Figure 2

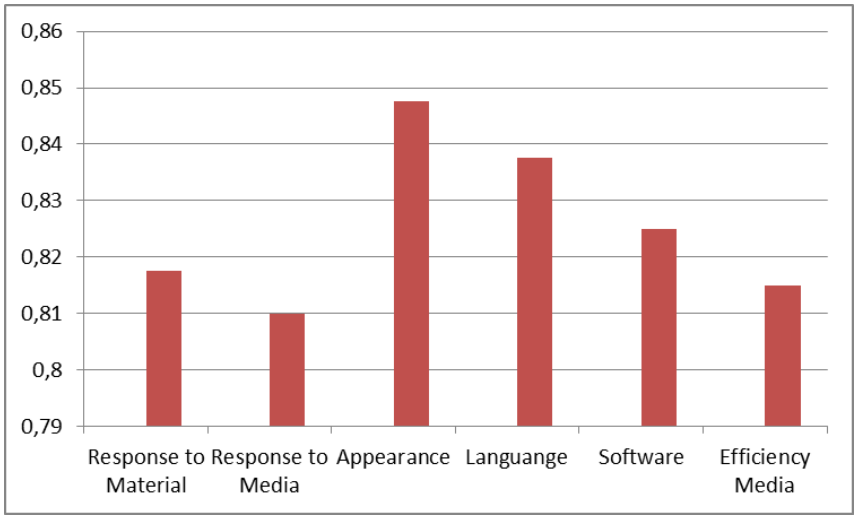


Figure 2. Student response on chemical bonding android base media with smart apps creator program

Based on Figure 2, it can be concluded that the total value of the overall average score of student responses is with a feasibility percentage of 82.6% in the range of good eligibility categories.

4.Conclusion

From the description above several conclusions are obtained, namely (1). The results of interviews with teachers show that to teach Chemical Bonding topic Android-based learning media is needed. (2). An Android-based Chemical Bond learning media has been obtained using the smart apps creator program with 7 feature specifications, namely main view, main menu, kearning material, evaluation, summary and references. (3). The lecturers and chemistry teachers gave very good responses and assessments of the Android-based chemical bond learning media obtained.(4). The Class X students of SMAN 5 Medan gave a good perception with an average rating of 82.6%.

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