



## Utilization of Autoplay to Develop Excretion System as Learning Media with Engklek Game Evaluation

Primadya Anantyartha<sup>1\*</sup>, Azizul Ghofar Candra Wicaksono<sup>2</sup>

<sup>1</sup> *Departement of Biology Education, IKIP Budi Utomo Malang, Indonesia*

<sup>2</sup> *University of Szeged, Hungary*

\*Correspondence Author: [anantyartha@gmail.com](mailto:anantyartha@gmail.com)

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### ABSTRACT

*The use of interactive multimedia as learning media is necessary to assist the learning process. The use of Autoplay in developing learning media enables the teachers to produce very good media in facilitating students' needs in learning excretory system material. The addition of an Engklek game is also very helpful in developing cognitive levels and activating students' motor skills. The method used in the use of Autoplay to develop learning media refers to the model developed by Lee and Owens 2004, namely the Analysis, Design, Development, Implementation and Evaluation (ADDIE) model. This development research stage is only carried out until the Analysis, Design, Development stage, because this research is only limited to developing learning media. After arriving at the development stage, the product is packaged in the form of a Compact Disk (CD) and submitted to the excretory system learning material expert and learning media expert to assess the feasibility of the product being developed, then tested on a small scale by expert practitioners and students to assess the quality of the product learning. The results of the validation of the material experts demonstrated the percentage of eligibility 95.71% with very good criteria and the results of the validation of the media experts disclosed the percentage of eligibility 97.14% with very good criteria. Supported by the results of the readability test of 10 student respondents and 1 practitioner who gave criticism and suggestions that the use of Autoplay to develop excretory system learning media with the evaluation of the designed Engklek game was very good and feasible to use.*

**Keywords:** *autoplay, media development, excretory system, engklek traditional game.*

### INTRODUCTION

Education is one of the most important sectors in human life. Efforts to prepare the present generation of youth from an early age to welcome and face the times in the global era, one of them is through education (Nurritha, 2018). Education must make a very large contribution to improving the quality of Human Resources (HR). Improving the quality of human resources can be successful if it is also supported by good quality education and the application and utilization of knowledge and information technology (Restini, 2018). Technology and information enable learning abilities that cannot be separated from space, distance and time (Pujilestari, 2020).

Learning that is applied in teaching and learning activities shall be designed effectively and creatively thus the learning process can also run effectively and knowledge can be conveyed properly (Mastura & Santaria, 2020). Teachers are necessary to apply learning strategies that are in accordance with the characteristics of each student, thus students are more motivated and have a high interest in learning (Sudarsana, 2018). In designing effective, creative and fun learning, teachers need to utilize information technology in learning activities (Rahim et al., 2019). This is

effective in improving the achievement of competencies and the possibility of students to achieve high interest in participating the learning (Andriani, 2015).

Teachers' efforts in realizing an effective learning process is difficult, there are still many teachers who have not implemented the learning process effectively and pleasantly. This is because teachers do not use information technology properly and the learning process is still conventional. Conventional learning is learning that is designed manually and still uses the lecture method (Jayawardana, 2017). The learning process is more dominant in the form of theory (Mastura & Santaria, 2020). The teaching materials used are instantaneous without any effort to plan, prepare, and compile them themselves (Nopratilova, 2018). This makes the learning process monotonous and less interesting which causes a lack of motivation and interest in learning for students in participating in learning, students also have difficulty understanding the material they are learning (Jayawardana, 2017). Therefore, teachers need to make new breakthroughs by utilizing information technology by developing learning media.

Learning media is a tool that can be used by teachers to deliver learning materials to students so that it is easier to understand (Wahyuningtyas & Sulasmono, 2020). The use of learning media in the teaching and learning process can attract new interests and desires for students, increase motivation and stimulation in participating in learning activities (Hikmawan & Sarino, 2018). Learning media are very diverse so teachers must be good at choosing learning media that are in accordance with student learning characteristics to be applied in the classroom (Sapriyah, 2019). Each student has different learning characteristics, there are students who are enthusiastic about participating in learning when supported by image and video media, there are also students who immediately understand the lesson just by reading the writing or just listening to the explanation and there are also students who understand the lesson if they are involved or practice directly. Learning process (Anantyarta & Sholihah, 2020). Interesting learning activities can be included using image, audio, and audio visual media, so that learning activities are not boring. One of the learning media that can be used in an interesting learning process is multimedia Autoplay.

Autoplay is a multimedia software that integrates various media elements such as text, images, video, sound, effects, music and flash into the learning media created (Bahri et al., 2018). Utilization of the Autoplay program in making learning media because it is easier to manufacture and use and is able to produce very good learning media (Anantyarta & Sari, 2017). The advantage of Autoplay is that users can create interactive multimedia, even though the user is not a media expert, because by using Autoplay users can create creative and innovative learning media (Rosyida & Adi, 2018).

The progress of the development of information technology in all aspects of life has a huge influence on the student environment. The development of information technology presents increasingly sophisticated digital systems such as online games and video games in the student environment which makes students increasingly forget about Indonesian cultural heritage, namely traditional games (Munawaroh, 2017). Based on previous research on traditional games, it has been proven that most of today's students play gadgets more often than playing traditional games which should be very important to understand and accept because it is a cultural heritage (Setiawan et al., 2021). Furthermore, the research conducted concluded that traditional games have begun to be abandoned by students today because traditional games do not feel like they have their own challenges which are really popular with children (Husein MR, 2021). According to research (Permadi et al., 2021), traditional games are very useful for sharpening cognitive levels and developing motor skills of students because traditional games in practice involve a lot of moving activities. Besides that, it can also foster cooperation and friendship (Setiawan et al., 2021). The development of traditional games in a modern form using information technology is expected to attract students so that traditional games do not become extinct because they are starting to be abandoned. One of the traditional games that is increasingly sinking is the Engklek game.

Engklek game is a traditional game of jumping on a flat plane drawn on the ground or on the floor, by making a picture of a box and then jumping with one foot from one box to the next (Permadi et al., 2021). In the game, a tool called Gaco is used in the form of ceramic shards or tiles and flat stones (Utami et al., 2018). Engklek is a traditional game that has benefits in improving social skills, detecting psychological problems, improving problem solving skills, honing students' motor skills (Mashluhah, 2020) and developing students' cognitive abilities (Munawaroh, 2017). The many benefits of the Engklek game make the Engklek game more effective when combined with information technology in a learning process to increase students' interest in participating in the learning process and can make the learning process fun for students, as well as an effort to preserve the traditional Engklek game so that it remains sustainable.

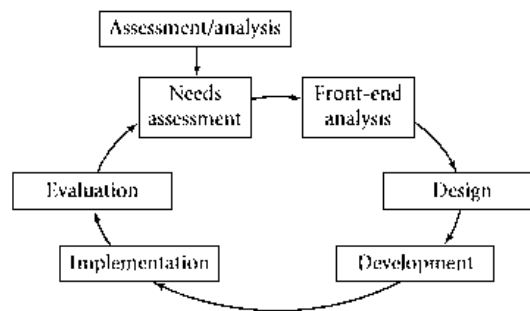
The learning system in schools can be developed by taking into account the uniqueness and advantages of an area, including culture and local wisdom in the community so that it can make students aware of the cultural heritage of their region and nation. The government has also supported efforts to preserve culture by including learning programs in the form of local culture. Science learning on excretory system material can be combined in an interactive and educational game as a learning evaluation to attract students' interest in participating in the learning process (Miluningtias & Shofiyah, 2021).

The importance of the use of learning media that is applied in the form of traditional games such as Engklek in science learning material on the excretory system because learning the excretory system focuses on studying organs and functions related to the physiological occurrence of expenditure in the body to dispose of metabolic waste substances so that they do not become toxic in the human body. The excretory system is a learning chapter that contains a lot of material and must be understood by students, so that to understand it, interactive multimedia such as Autoplay is needed as a tool to deliver learning material that can contain explanations through text, images and videos with an attractive and interactive display (Anantyartha & Mardiana, 2020). Learning media designed in the Autoplay program with the Engklek game as a learning evaluation on the excretory system material as an effective and fun learning innovation, because in it there is the concept of learning while playing (Khasanah, 2020). In addition to developing students' cognitive levels, they can also activate students' motor skills (Alaska & Hakim, 2021).

Based on the description above, it is formulated what the right solution to accommodate the development of learning media with traditional games as an evaluation of the excretion system material, it is expected that the role of autoplay can be the right solution. It aims to develop interactive learning media with the evaluation of the Engklek game so that the learning process can take place effectively and fun to achieve learning objectives. In addition, it can attract students' interest in participating the learning process and make teachers more innovative in designing learning media.

## **METHODOLOGY**

The present developmental research refers to the development model developed by Lee and Owens (2004) or known as the ADDIE model. The steps of the ADDIE development model are: Analysis, Design, Development, Implementation, Evaluation (Lee & Owens, 2004). The selection of this model is based on the consideration that this model has a systematic arrangement of development steps in developing a learning multimedia product. Moreover, this model shows the stages of multimedia learning design that are rational and more complete (Sari, 2017), and are easy to learn. These stage are shown in figure 1.



**Figure 1. Chart of learning media development procedures** (Lee & Owens, 2004)

This development research has a procedure that displays several stages of development of product. The product produced in the development of this learning media is packaged in the form of a CD (*Compact Disk*) which has been designed in the form of interactive multimedia that integrates media in the form of images, videos, text (learning materials) and music which will be validated by two expert validators, namely the material expert validator excretion system learning and learning media expert validator. And thus, a small-scale readability test will be conducted by expert practitioners and students.

The first stage in the development of this research is the Analysis stage. The analysis stage is carried out to analyze the need for a new learning method development. Furthermore, an analysis is carried out by identifying the background and characteristics of learning. As well, an analysis of the needs to assist learning is also carried out. In analysis, a questionnaire was made containing questions addressed to teachers and students. The needs analysis containing questions aims to determine the extent to which learning media have been used in learning and to determine the need for a development of learning media in facilitating the learning process. Next, determine the type of program used and analyze the types of traditional games used as learning evaluation materials

The second stage is the Design stage. At this stage, a series of processes are carried out in designing learning multimedia, starting from determining the expected learning media criteria, setting learning objectives, media specifications such as organ images, material texts, learning videos and designing games that are used as learning evaluations. Designing a media display from start to finish is important to make a media into a product that can be implemented. The display of learning media products can contain covers and displays that are equipped with image, text, audio, video and music icons.

The third stage is Development. The development stage is an activity to realize a product that has been designed so that a good and quality product is produced. The product is packaged in the form of a CD (*Compact Disk*) and handed over to the lecturer as an expert validator of excretory system learning materials and an expert validator of learning media to assess the feasibility of the product being developed, then tested on a small scale to expert practitioners and students to assess the quality of the learning product. To assess the feasibility and quality of the developed product, a research instrument was given in the form of a questionnaire containing several statements to be filled out by validators, expert practitioners and students. The research instrument in the form of a questionnaire aimed at material experts is described on the validation sheet according to table 1 and learning media expert in table 2.

**Table 1. Assessment instruments by experts on excretory system learning materials**

No	Rated aspect	Indicator
1	Content Eligibility	Completeness of human excretory system material in learning media
		The correctness of concepts and procedures
		Accuracy of facts presented

No	Rated aspect	Indicator
2	Language	Conformity with the development of students' thinking Correct sentence structure The grammar used in the learning media refers to good and correct Indonesian rules
3	Presentation	Consistent presentation of material
4	Material Content	The compatibility between the syllabus and the excretory system material in humans Have an attachment to core competencies and basic competencies in the excretory system material in humans Match between basic competencies and learning objectives The depth of coverage of the excretory system material in humans is under discussion Clarity in presenting excretory system material in humans
5	Evaluation	Evaluation questions according to the material of the human excretory system The suitability of the content of the type of question with the material of the human excretory system The suitability of the question form with the excretory system material in humans

Developed from (Pratiwi, 2019) and (Nugroho, 2017)

**Table 2. Assessment instruments by learning media experts**

	Rated aspect	Indicator
1	Usability	The attractiveness of the learning media made
2	Color	Appropriate use of color
3	Language	Language use Sentence writing
4	Balance	Scan design and layout
5	Shape	The accuracy of the button layout used Consistency of buttons used The accuracy of the typeface used Display pictures and videos The relevance of the use of images and videos that are relevant to the material Font size on presentation material Autoplay media display size Support video size Instructions for using Autoplay learning media
6	Design	Initial view on Autoplay Color match on each page Autoplay The harmony of color combinations on Autoplay media Use of background music instrument Conformity between the use of colors, images and the format of the explanation of the material
7	Cohesiveness	Clear instructions for use
8	Program processing quality	Ease of use and operation of Autoplay learning media

Developed from (Pratiwi, 2019) and (Nugroho, 2017)

For the readability test, a questionnaire was also given to test the effectiveness of the developed learning media products with several statements given to expert practitioners and students which are described in the table 3.

**Table 3. Instruments for assessing the readability test or the practicality of learning media**

No	Assessment Aspect
1	Cover and menu design according to the content
2	The type and size of the letters or text used is appropriate
3	Pictures and videos according to the material

No	Assessment Aspect
4	The size and layout of images and videos on the media are appropriate and can be seen clearly.
5	The excretory system material in humans included in the Autoplay learning media is interesting and easy for you to understand.
6	The display of the autoplay learning media which is added by the traditional engklek game in the evaluation of the material for the human excretory system is interesting.
7	The material used is in accordance with the relevant sources
8	The language used is easy for you to understand
9	Autoplay learning media designed to make it easier for you to understand the concept of excretory system material
10	The evaluation instrument in this autoplay learning media is interesting

Developed from (Rahmawati, 2015) and (G. E. Putri, 2014)

Development research is an activity that is carried out systematically in designing, developing and evaluating a program to produce a new product that is suitable for use. Development research is used to produce a new product and to test the effectiveness of the feasibility of a product designed through a validation system (Syamsuddin & Fuady, 2020). The validation results from the validator regarding the learning media products packaged in the form of a CD (Compact Disk) obtained data that was collected using the assessment aspects in the table (see tables 1 & 2). The data contained in the assessment instrument is also equipped with a description assessment thus the validator can provide constructive criticism and suggestions in order to provide input and improvement regarding the developed learning media.

The data collected is then grouped by its type, namely quantitative data and qualitative data through questionnaire instrument in the form of a checklist symbol, a response column and suggestions. The data from the questionnaire is type of quantitative data which is qualitatively validated using the Linkert scale where each statement of the validator gives a score for each aspect that is asked of the learning multimedia. Quantitative data was obtained through a checklist questionnaire according to the criteria of the validator, while qualitative data was obtained through the comments and suggestions column. Then analyzed by calculating the percentage of item scores on each statement or question in the questionnaire. The quantitative data obtained were analyzed using the average analysis technique. The following is the formula for determining the percentage.

$$P = \frac{\sum x}{\sum x^I} \times 100\% \tag{1}$$

Description :

P : Eligibility Percentage

$\sum x$  : Total Score of Validator Answer

$\sum x^I$  : The Total Number of highest Answer Scores

The calculated data using the above formula will then be compared with table 4 to determine the eligibility criteria based on the percentage obtained. The value can determine the feasibility of the material or media into very poor to very good criteria based on table 4.

**Tabel 4. Instruments for assessing the readability test or the practicality of learning media**

Percentage (%)	Eligibility Criteria	Remarks
90-100	Very Good	No Revision Needed
75-89	Well	No Revision Needed
65-74	Enough	Need Revision
55-64	Not Good	Need Revision
0-54	Very Not Good	Total Revision

Developed from (Nugroho, 2017)

## RESULT AND DISCUSSION

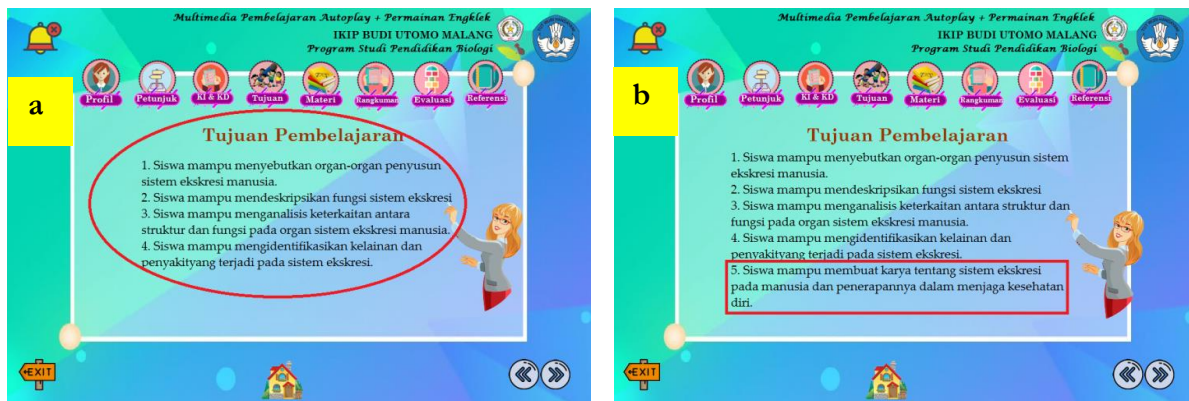
The results of this development research are learning media products that have received the eligibility criteria from the validation results by excretory system learning materials experts and learning media experts. Data from the results of material expert validation can be seen in table 5.

**Table 5. Summary of validation results by material experts**

No	Aspect of Assessment	Indicator	Maximum Score	Validator Score
1	Content Eligibility	3	15	14
2	Language	3	15	15
3	Presentation	1	5	5
4	Material Content	4	20	18
5	Evaluation	3	15	15
<b>Maximum Score</b>		<b>70</b>		
<b>Number of validator Score</b>		<b>67</b>		
<b>% Appropriateness</b>		<b>95,71 %</b>		
<b>Eligibility Criteria</b>		<b>Very Good</b>		

Based on table 5 regarding the results of material expert validation regarding the developed learning media products, it is known that the number of aspects of assessment regarding the feasibility of content, language, presentation, material content and evaluation on the use of Autoplay to develop excretory system learning media with the evaluation of the Engklek game get a feasibility percentage value of 95.71% with a validator score of 67 from a maximum score of 70 from a scale of 5. These results indicate that the material in the learning media is included in the very good eligibility criteria. According to (Ramli et al., 2018) learning media can attractively produce better and maximum quality of learning so as to support the achievement of student competencies including in subjects.

Here are some media displays as well as input and improvements for the development of Autoplay learning media



Based on Figure 2(a) it is known that prior to input from material experts, in the learning objectives section there was no basic competency point 4.10, namely making works on the human excretory system and its application in maintaining personal health. Efforts to maintain personal health in the excretion process can be done by playing Engklek which makes students actively move in developing their motor skills so that from playing activities sweat will be excreted in the body and thus substances that are not needed in the body will be excreted along with sweat. The Engklek game is one type of traditional game that uses objects and counts, in the Engklek game there is an agreement of rules that must be obeyed by students as players with regard to its implementation. The Engklek game can develop students' cognitive abilities and discipline

(Munawaroh, 2017) and is related to students' motor activities when jumping over boxes drawn on the ground or floor (A. B. U. Putri & Hasyim, 2017). The display of the media after being given input by the validator and corrected can be seen in Figure 2(b) where the basic competency points 4.10 have been included. Subsequent inputs and improvements will be seen in Figures 3(a) and 3(b) below.

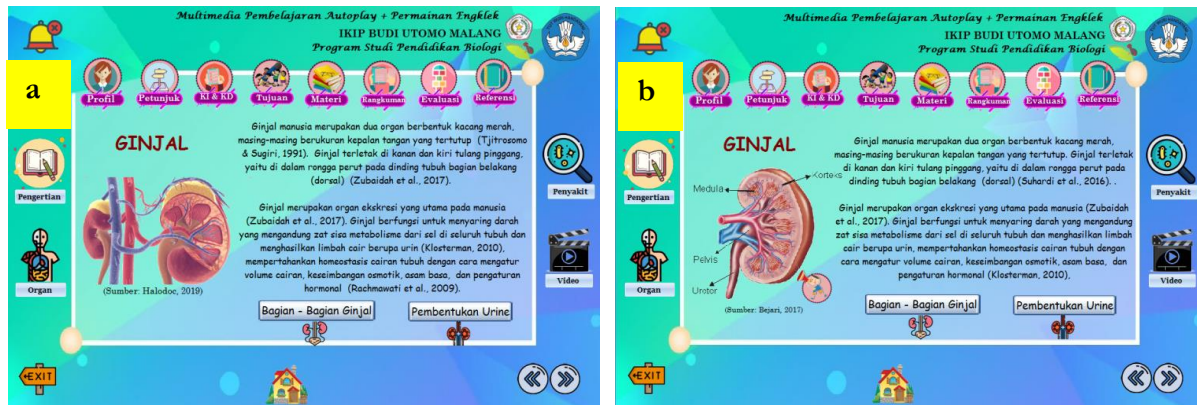


Figure 3(a) Media material before and Figure 3(b) Media material after including valid or clear sources

Based on Figure 3(a) it is known that before there was input from material experts, several concepts of the excretory system material in humans did not include clear sources. The importance of a clear source in a study can develop a new concept that is more complete so that after being revised by a material expert, the concept of the excretory system has been included with a valid source. The images used to support the material are also replaced with clearer sources as shown in Figure 3(b).

Continuing on the learning media component, the data obtained from the validation results by learning media experts are briefly shown in table 6.

Table 6. Summary of validation results by media experts

No	Assessment Aspect	Indicator	Maximum Score	Validator Score
1	Usability	1	5	5
2	Color	1	5	5
3	Language	2	10	9
4	Balance	1	5	5
5	Shape	9	45	43
6	Design	5	25	25
7	Cohesiveness	1	5	5
8	Quality	1	5	5
<b>Maximum score</b>		<b>105</b>		
<b>Number of validator scores</b>		<b>102</b>		
<b>% Appropriateness</b>		<b>97,14 %</b>		
<b>Eligibility Criteria</b>		<b>Very Good</b>		

Based on table 6 above, it is known that from all aspects of the assessment the percentage value of eligibility is 97.14% with a total validator score of 102 and a maximum score of 105 from a scale of 5. These results indicate that the media designed in the development of learning media Autoplay is added the traditional Engklek game on the evaluation of the human excretory system material is included in the very good eligibility criteria and can be used without revision. Efforts in developing this learning media require data stating the validity of media experts and material experts, and supported by a readability test which will strengthen that the learning media designed are really suitable for use in the learning process (Juniarti, 2020).



Based on the results of the readability test of the Autoplay learning media, the traditional Engklek game was added to the evaluation of the human excretory system material given to 10 students of SMAN 01 Sengah Temila, West Kalimantan. The assessment of students is based on the quality of the media description of the letters: P (Poor), E (Enough), G (Good), and VG (Very Good) with the percentage of assessment results listed in table 7.

**Table 7. Instruments for assessing the readability test or the practicality of learning media**

No	Assessment Aspect	Percentage of Eligibility Quality			
		P	E	G	VG
1	Cover and menu design according to the content	-	-	20%	80%
2	The type and size of the letters or text used is appropriate	-	-	30%	70%
3	Pictures and videos according to the material	-	-	-	100%
4	The size and layout of images and videos on the media are appropriate and can be seen clearly.	-	-	20%	80%
5	The excretory system material in humans included in the Autoplay learning media is interesting and easy for you to understand.	-	-	10%	90%
6	The display of autoplay learning media which is added by the traditional engklek game on the evaluation of the material for the human excretory system is interesting.	-	-	30%	70%
7	The material used is in accordance with the relevant sources	-	-	40%	60%
8	The language used is easy for you to understand	-	-	40%	60%
9	Autoplay learning media designed to make it easier for you to understand the concept of the excretory system material	-	-	20%	80%
10	The evaluation instrument in this autoplay learning media is interesting	-	-	10%	90%

Developed from (Rahmawati, 2015) dan (G. E. Putri, 2014)

Based on the test results on 1 practitioner, namely one of the teachers at SMA Negeri 1 Purwosari, the results were obtained, namely the practitioner gave a very good assessment of the eligibility criteria for aspects of suitability of cover and menu designs on learning media, suitability of images and videos with material, size and layout of images and videos on the media are precise and can be seen clearly, the excretory system material in humans is included in the Autoplay learning media that is interesting and easy to understand, the interesting display of the autoplay learning media is that the traditional Engklek game is added to the evaluation of the human excretory system material, the material used is in accordance with the source that is relevant, the language used is easy to understand, the autoplay learning media designed to make it easier for students to understand the concept of the excretory system material, interesting evaluation instruments in the autoplay learning media. Meanwhile, the aspect of assessing the suitability of the type and size of the letters or texts was used to receive good eligibility criteria from the practitioners of the readability test.

## CONCLUSION

Based on results obtained in this line of research, it can be concluded that the learning media has met the eligibility criteria and hence it is good and feasible to use in supporting the learning process. The formulated statements are based on the results of the feasibility test received from the validation results by experts on excretory system learning materials and learning media experts. The results of material expert validation disclosed a percentage of 95.71% and the results of media expert validation demonstrated a percentage of 97.14%. And therefore, by way of conclusion, It is in the category of very good eligibility criteria. These findings are also assisted by the results of the readability test of 10 student respondents and 1 expert practitioner who stated that the learning media designed were very good and feasible to use. The learning media developed have met the criteria to be very good to use, and thus in its usage, they need to be supported by more adequate facilities such as information technology tools. For further

researchers who are eager to develop learning media with the similar program, it is expected that they can conduct other studies with different materials supported by more relevant references.

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