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Development of Interactive Learning Media on Endocrine System Material to Increase Learning Motivation for Class XI SMA Students

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Abstract: This research aims to produce interactive learning media that is feasible, practical and effective to use on endocrine system material to increase learning motivation for class XI high school students. This research uses the method Research and Development (R&D) with the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) development model. The research was conducted at SMA Negeri 1 Minggir on class XI MIPA students consisting of 2 classes, namely the control class and the experimental class with a total of 36 students each. The data collection instruments used were material expert and media expert validation sheets, biology teacher assessment sheets, student response sheets and non-test instruments in the form of questionnaires. Analysis of learning motivation data was calculated using the independent sample t-test with a significance level of 0.05. The average learning motivation obtained in the experimental class was 89.98 with an N-gain value of 0.75 in the high category, while the average learning motivation in the control class was 59.72 with an N-gain value of 0.55, in the medium category. Based on the results of the Independent Sample t-test, the results obtained were 0.000 < 0.05 and it was stated that media use interactive learning proven effective in increasing student learning motivation.

Keywords: Endocrine system; Interactive learning media; Motivation to learn

Introduction

The application of 21st century learning requires each student to have motivation to learn with the aim that students are able to keep up with developments so that they can improve their learning outcomes (Destyana et al., 2021). Motivation can be said to be the overall driving force within students which gives rise to learning activities, ensures the continuity of learning activities and provides direction to learning activities. Motivation to learn arises from the encouragement each individual carries out consciously or unconsciously to achieve the desired learning goals (Fajrina et al., 2018; Manggabarani et al., 2016). Motivation is needed because it can motivate students to participate in learning enthusiastically, so that learning becomes a fun activity. Low student motivation to learn will hinder the achievement of educational goals and is a threat to the nation's progress which must be handled appropriately (Blašková et al., 2019; Jiao et al., 2022; Santosa et al., 2016).

It is important for every student to have motivation to learn, that way students will have greater enthusiasm and curiosity to understand the learning process and achieve learning goals in the way they want (Kurniawan et al., 2020). Without a high level of learning motivation in students, learning will not run effectively, so student learning motivation must be considered and increased.

The results of the preliminary analysis that has been carried out show that students' learning motivation is relatively low, it can be seen that during the learning process students tend to be bored, disinterested and unfocused. Low motivation to learn is caused by two

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factors, the first is extrinsic factors in the form of students' difficulties in understanding the subject matter which causes students bored, uninterested and unfocused during learning, so students easily become discouraged, indifferent and lazy to learn. Low student motivation to learn due to difficulty understanding the material obtained a result of 16.25%.Second are intrinsic factors which include interest, intelligence, talent and attitude. Santosa et al. (2016) stated that the factors within students that cause low motivation to learn are the student's condition, abilities and student aspirations with a percentage of 48.12%.

In education, there is a learning process that involves teachers and students to understand the subject matter. Material that is abstract and complex makes it difficult for students to understand it. One material that is difficult for students is the endocrine system. The endocrine system has abstract and complicated material characteristics, one of which is because it is related to structure, function and disorders/abnormalities that occur. So to learn it is not enough just to memorize all aspects of the material, but rather to understand the concepts contained in it (Yusup, 2018).

The results of the needs analysis carried out by distributing questionnaires to class XII students at SMAN 1 Minggir showed that a percentage of 72% of students chose the endocrine system as material that was difficult to understand. The concept of the endocrine system is said to be difficult because it covers structure and function as well as disorders/abnormalities that occur. Learning difficulties experienced by students in the endocrine system material are characterized by students who do not reach the KKM score limit due to misconceptions about organ structure (Irmayanti et al., 2017; Utami et al., 2022). Badruzzaman et al. (2019) further explained that the percentage of students who answered questions related to disorders of the endocrine system was 29.76% (low category). Discussion of diseases of the anterior pituitary gland with a case study of a tumor sufferer who complained of feeling tired, weight loss and low blood sugar levels. Many students answered that this affects the production of the hormone glucagon so that levels are deficit, but in fact this condition can occur due to a deficit of the hormone Adrenocorticotropic hormone (ACTH).

The learning process in the industrial revolution 4.0 era has experienced many changes. These changes include; it is easier to find learning resources, there are more choices for using and exploiting ICT, and the increasing role of media in learning activities (Harahap et al., 2020). The results of observations carried out at SMAN 1 Minggir found that the learning resources used were printed books and the use of PowerPoint media. The use of these learning resources tends to make students feel bored because learning is dominated by teachers who present information in a linear or one-way manner and position the teacher as an active actor, while students are relatively passive, just accepting and following what the teacher says.

As educational staff, teachers must be able to follow developments in Science and Technology (IPTEK) in order to create new breakthroughs starting from learning methods, teaching materials, learning resources and learning media. Therefore, to overcome the problems faced by students related to low learning motivation, a learning innovation is needed, namely the use of media that can stimulate the learning process to be effective and efficient in a conducive atmosphere so that it can help students understand quickly.

Technology-based learning media in interactive form is one innovation that can be used. Interactive learning media are learning programs that combine images, text, sound, video and animation with the help of computer devices or similar to achieve certain learning goals and allow users to interact actively. Interactive media has a positive effect on student learning motivation. The interactions that occur in it will make it easier for users to process information and provide a pleasant atmosphere (Wulandari, 2020).

Learning media that is integrated with technology is an important learning resource to support the learning process because it can stimulate students' thoughts, feelings, attention and abilities or skills. The lack of use of technology results in less than optimal achievement of learning objectives and mastery of competencies by students (Roemintoyo et al., 2021). In general, the advantages of interactive learning media are that learning activities are more fun, interactive, the quality of student learning increases and the learning process can take place anywhere (Pebriyanti et al., 2021).

The use of interactive learning media can make students' concept formation abilities faster than just listening and can make the atmosphere in the class more enjoyable. There is a positive relationship between learning motivation and student learning outcomes after using interactive multimedia (Rahman et al., 2021).

The interactive learning media developed is Ensysmel media (Endocrine System Learning), namely interactive learning media with learning content on endocrine system material which is arranged based on learning objectives in the curriculum applicable in schools. Media is prepared with a combination of various elements such as text, images, video and audio which can increase students' learning motivation, making study time more efficient because learning can be done anywhere, even if not in the classroom.

Product development is carried out based on the results of an analysis of student needs in schools, with the hope that interactive learning media on endocrine

system material can increase high school students learning motivation.

Method

Research Design

This research uses Research and Development (R&D) research. The development model used is the ADDIE development model by Branch (2009), consists of 5 stages, namely analyze, design, development, implementation and evaluate.

Population and Sample

The population in this study were all students of SMA Negeri 1 Minggir. The sampling technique is carried out randomly (random sampling), that is, sampling is taken without considering the levels in a population, so that each individual has the opportunity to be sampled. The sample consisted of two classes, namely the experimental class and the control class with 36 students each.

Data Collection Techniques and Instruments

The data collection techniques used were observation, interviews with biology teachers and giving questionnaires to class XI and class XII students. The data collection instruments used were material expert and media expert validation sheets, biology teacher assessment sheets, student response sheets and non-test instruments in the form of learning motivation questionnaires with the preparation of statement items based on indicators according to Sardiman (2016). The instruments used in the research have gone through expert validity tests and trials on students in order to determine the quality of the statement items.

Data Analysis Technique

Analysis of student learning motivation data using SPSS Ver software 27, the results of the learning motivation questionnaire assessment were analyzed using descriptive statistics and inferential statistics. Descriptive statistical analysis is to present data in tabular form, while inferential statistics consists of prerequisite tests including normality and homogeneity tests as well as the T test which is analyzed using independent sample t-*test* at a significance level of 0.05. Increasing student learning motivation can be seen through calculating the average N-gain score using the following formula (Hake, 1998).

$$N\text{-}Gain=\frac{skor\ posttest-skor\ pretest}{skor\ maksimum-skor\ pretest} \quad (1)$$

Table 1. Index Criteria N-Gain

Score Intervals	Classification
0.00 ≤ gain score ≤ 0.3	Low
0.3 ≤ gain score ≤ 0.7	Enough
0.7 ≤ gain score ≤ 1.0	Tall

Results and Discussion

Analysis Stage

The results of the analysis that have been carried out show that the school has provided an internet network that can be accessed by both teachers and students, the learning resources used are printed books and the use of PowerPoint media, teachers experience difficulties in conveying the material optimally due to limited time, students are still lacking enthusiasm in learning. , students also look bored when learning, especially with students' lack of understanding of the material which causes students to be indifferent to learning, endocrine system material is material that is difficult to understand because of its complex and abstract characteristics and the lack of use of interactive learning media in the learning process, so it is very possible if interactive learning media is applied in the learning process so that the learning resources used are more varied and attract students attention.

Design Stage

The design stage is the product design stage based on the results of the needs analysis that has been carried out. Researchers create product designs with the aim that the learning media developed is in accordance with student needs. The designs made include: firstly designing a storyboard in the form of a general description of the learning media that will be developed, secondly designing the learning content, by describing the material and determining the learning objectives that students will achieve. The material presented in the learning media is the endocrine system based on learning objectives (TP) which refer to TP code 11.8.7. Students can analyze the relationship between the structure and function of endocrine organs and 11.8.8. Students can analyze disorders/abnormalities in endocrine organs. Third, designing research instruments consisting of a learning motivation questionnaire and a validation sheet for the learning motivation questionnaire.

The product being developed has several menus with different content, namely the opening page and the main page as well as several main menus including: instructions for use, CP & TP, orientation, activities, materials, drag and drop quizzes, evaluation, references and developer profile.

Development Stage

The activity at this stage is to realize the product design that was created at the design stage based on product validation by media experts and material experts, biology teachers and students. The resulting product is an application of Ensysmel media (endorine system learning) with content on endocrine system material. Based on the design that has been prepared, the results of the development of Ensysmel media are described as follows:

Product Development

Opening page

The opening page contains the media title and assigned material. To enter the next page student need to press the start button. The opening page display can be seen in Figure 1.

Figure 1. Opening page display

Main course

This page contains several main menu options that students can access, consisting of instructions for use, CP & TP, orientation, activities, materials, drag and drop quizzes, evaluations, references and developer profiles. The main menu page display can be seen in Figure 2.

Figure 2. Main menu page display

Instructions for use

The usage instructions page contains guidance for students in operating learning media. There are steps by steps that students must take during learning. The user manual menu display can be seen in Figure 3.

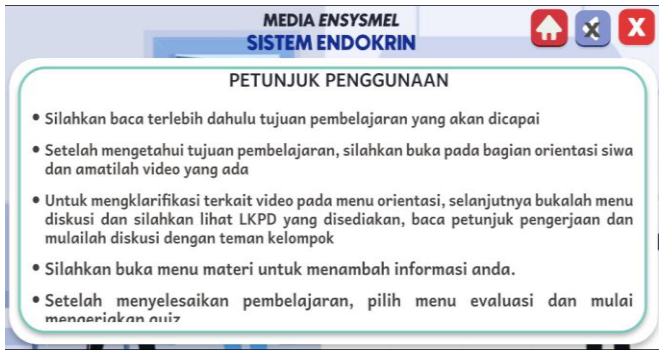

Figure 3. User instructions menu display

CP & TP page

This page contains CP & TP which are adapted to the independent curriculum. Learning objectives refer to TP 11.8.7 and 11.8.8. The CP & TP menu display can be seen in Figure 4.

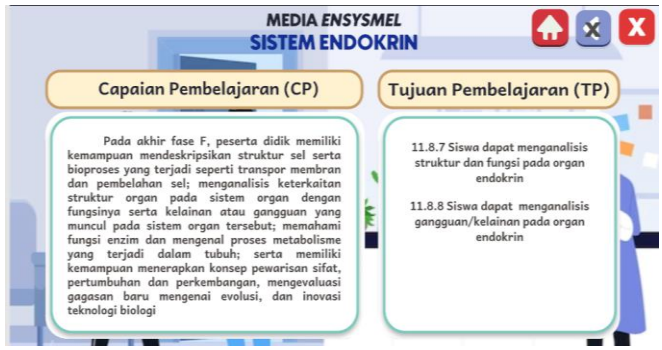

Figure 4. CP & TP page display

Orientation Menu

This menu contains problems in video form as an initial learning context to motivate students to engage in problem solving activities and gain initial knowledge regarding the endocrine system material. The orientation menu display can be seen in Figure 5.

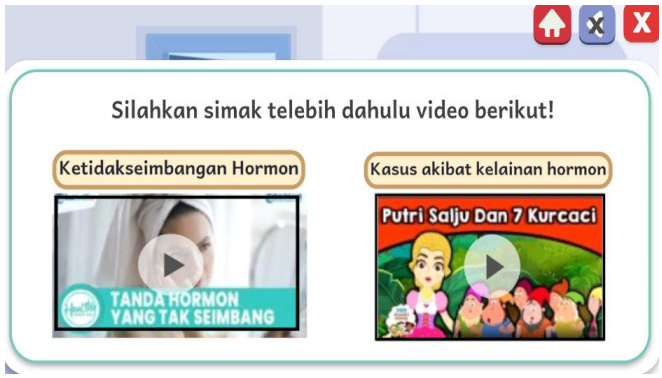

Figure 5. Orientation menu display

Activities Menu

This menu contains LKPD material on the endocrine system that students will analyze, with stages including the article analysis process, organizing

students, gathering information, presenting work results and evaluating. The activity menu display can be seen in Figure 6.

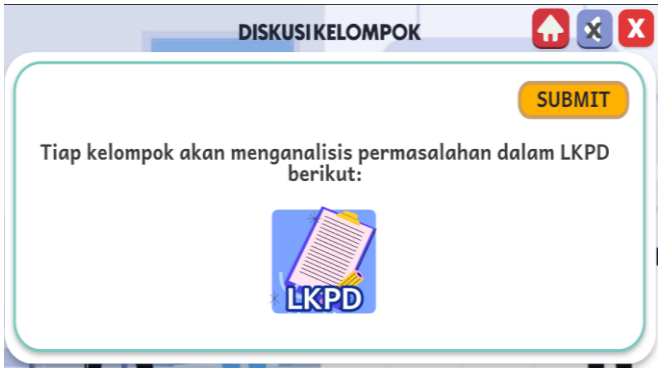

Figure 6. Activity menu display

Material Menu

This menu contains learning activities that present material on the endocrine system related to structure/function as well as disorders/abnormalities of the endocrine glands, apart from that there are videos to strengthen student understanding. The material menu display can be seen in Figure 7.

Figure 7. Material menu display

Drag and Drop Quizzes

How to play quiz *drag and drop* is to match the image and type of gland/disease in the endocrine system by moving the name of the available organ/disease to the appropriate image, the drag and drop quiz menu display can be seen in Figure 8.

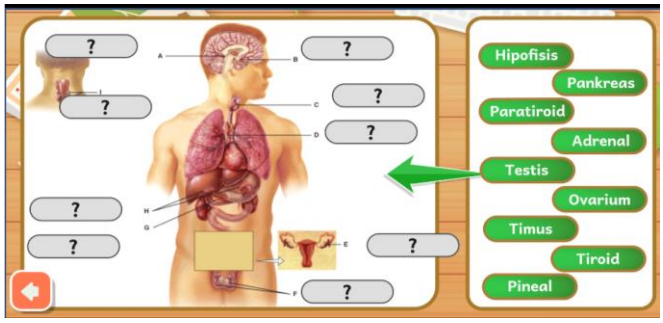

Figure 8. Drag and drop quiz menu display

Evaluation Menu

The evaluation menu contains 10 multiple choice questions each-5 questions each for each learning objective, at the end of the activity when students have finished answering all the questions, the grades obtained will be seen, the evaluation menu display can be seen in Figure 9.

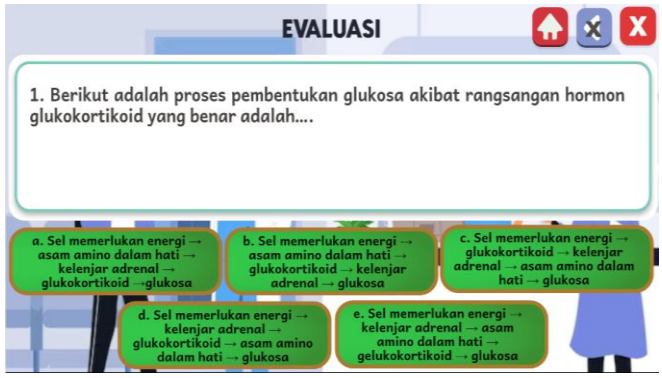

Figure 9. Evaluation menu display

Reference

The sources used in compiling the content have been documented on the reference page. The display of the reference menu can be seen in Figure 10.

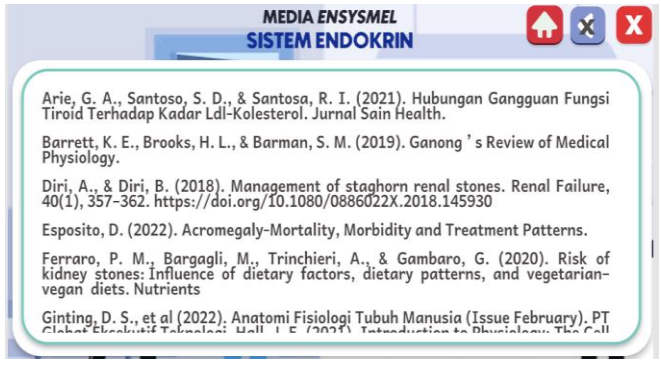

Figure 10. Reference menu display

Developer Profile

Developer profile is a menu that displays the identity of the learning media developer, the display of the developer profile page menu can be seen in Figure 11.

Figure 11. Developer profile page display

Product Feasibility and Practicality Results
Feasibility of material on Ensysmel media

The assessment of the material contained in Ensysmel media is based on 3 aspects, namely the content aspect, the material presentation aspect and the readability aspect with the criteria of very suitable, suitable, not suitable and very not suitable. The following are the assessment results obtained.

Table 2. Results of Feasibility Assessment by Material Experts

No	Assessment aspect	Evaluation	Criteria
1-11	Content aspect	4	Very worthy
12-15	Aspects of material presentation	3.5	Very worthy
16-20	Readability aspect	4	Very worthy
Average		3.83	Very worthy

Based on the results of the feasibility assessment in Table 2, it can be explained that the concept of material presented in the learning media is in accordance with the endocrine system material and is based on the learning objectives (TP) achieved including structure/function as well as disorders/abnormalities that occur in the endocrine glands, pictures are presented and videos to strengthen students' understanding, using language that is easy to understand and supported by student worksheets (LKPD) to train students' thinking skills through the problem solving process.

The average score obtained from the three aspects of material expert assessment was 3.83 with very appropriate criteria, so it was concluded that the material presented in Ensysmel media was suitable for use in learning activities. The presentation of material in the media is in accordance with the learning objectives to be achieved. Research conducted by Portana et al. (2021) explained that the material developed is a tool that can help teachers convey knowledge in a very natural way so that it leads to a good teaching and learning process.

Ensysmel media feasibility

The assessment of Ensysmel media is based on 2 aspects, namely the graphic aspect and the media and content aspect with the criteria of very suitable, suitable, not suitable and very not suitable. The assessment results obtained are:

Table 3. Results of Media Expert Feasibility Assessments

No	Assessment aspect	Evaluation	Criteria
1-7	Graphic aspect	4.00	Very worthy
8-15	Media and content aspects	4.00	Very worthy
Average		4.00	Very worthy

Based on the results of the feasibility assessment in Table 3, it can be explained that the Ensysmel media developed has a good appearance and complies with the rules for preparing learning media. The media is arranged by combining text, images, audio, video so that it attracts students' attention, the navigation provided does not cause user (student) confusion, there are instructions for use that make it easier for students in class activities, the background, type and size of letters are suitable so they are easy to read and use language that is easy for students to understand.

The average score obtained from both aspects of the media expert assessment is 4.00 with very appropriate criteria, so it can be concluded that the Ensysmel media developed is suitable for use in learning activities. Based on this assessment, it is known that the quality aspects of interactive learning media do not cause boredom for students because there is a combination of text, images, audio and video in it (Armi et al., 2021).

Practicality Assessment Results
Practicality assessment by biology teachers

Practicality assessment by the class XI biology teacher at SMA Negeri 1 Minggir with the specifications of having taught for at least 2 years and understanding the material in class XI. The assessment is based on 4 aspects, namely graphic aspects, media and content aspects, content aspects and readability aspects. The assessment results obtained are:

Table 4. Results of Practicality Assessment by Biology Teachers

No	Assessment aspect	Evaluation	Criteria
1-5	Graphic aspect	3.0	Practical
6-10	Media and content aspects	3.8	Very practical
11-17	Content aspect	3.5	Very practical
18-20	Readability aspect	3.0	Practical
Average		3.32	Very practical

Based on the results of the practicality assessment by the biology teacher, it was explained that Ensysmel media was interesting to study, the material presented was in accordance with CP and TP. Ensysmel media content is structured clearly, systematically, covers all learning objectives and is equipped with relevant and contextual examples. Ensysmel media has an attractive design because it is not only an explanation but is equipped with pictures, videos and examples of disorders of the endocrine glands which are presented in the LKPD article. There are clear instructions for using media, appropriate combinations of fonts, colors and backgrounds that do not cause reader confusion. Apart from that, Ensysmel media is easy to operate and uses language that is easy for students to understand.

The average score obtained from the four aspects of assessment by biology teachers is 3.32 with very practical criteria, so it can be concluded that the Ensysmel media in the endocrine system material is ready to be used in learning activities. This shows that teachers assess media as an effective tool in presenting learning material. As stated by Sudarmanto et al. (2006), the attractive display quality in learning media acts as an effective stimulus that triggers student responses. Apart from that, students will be active in building their own understanding and be able to understand concepts well which is reflected in the clear presentation of the material.

Practicality Assessment by Small Group Students

Assessment in small groups (limited trials) was carried out on 15 class XII students with the criteria of students who had studied the endocrine system material. The assessment is based on 4 aspects, namely graphic aspects, media and content aspects, content aspects and readability aspects. The assessment results obtained are:

Table 5. Results of Small-Scale Practicality Assessment

No	Assessment aspect	Evaluation	Criteria
1-5	Graphic aspect	3.66	Very practical
6-10	Media and content aspects	3.53	Very practical
10-16	Content aspect	3.49	Very practical
15-20	Readability aspect	3.51	Very practical
Average		3.54	Very practical

Based on the results of a small-scale practical assessment of students involving 15 respondents from class , videos are presented on each type of endocrine gland to strengthen students' understanding of the material, the combination of fonts, colors and backgrounds is appropriate and does not cause confusion for the reader, can be operated on all types of cellphones, both Android and iOS using applications or websites and the language used is easy to understand and don't encounter problems when operating Ensysmel media.

The average score obtained from the four aspects of student assessment on a small scale is 3.54 with very practical criteria, so it can be concluded that the Ensysmel media on the endocrine system material is ready to be used in learning activities.

Practicality Assessment by Large Group Students

A large group assessment (field trial) was carried out on 36 class XI students who would take part in learning material on the endocrine system. The assessment is based on 4 aspects, namely graphic aspects, media and content aspects, content aspects and readability aspects. The assessment results obtained are:

Table 6. Results of Wide-Scale Practicality Assessment

No	Assessment aspect	Evaluation	Criteria
1-5	Graphic aspect	3.56	Very practical
6-10	Media and content aspects	3.54	Very practical
10-16	Content aspect	3.53	Very practical
15-20	Readability aspect	3.60	Very practical
Average		3.55	Very practical

Based on Table 6, it is explained that Ensysmel media is interesting to learn, students find it easy to operate the media because there are clear instructions for use, the material is presented clearly and is equipped with pictures of each endocrine gland, videos are presented on each type of endocrine gland to strengthen students' understanding of the material. , the combination of fonts, colors and backgrounds is appropriate and does not cause confusion for readers, can be operated on all types of cellphones and the language used is easy to understand and there are no problems when operating the system media.

The average score obtained from the four aspects of student assessment on a broad scale is 3.55 with very practical criteria, so it can be concluded that the Ensysmel media on the endocrine system material is ready to be used in learning activities.

A product is said to be practical if it can be used or applied by teachers and students easily according to the desired principles, aims and objectives. The practicality of Ensysmel media lies in the ease of operating the media which can be run anytime and anywhere, so that students can study according to the schedule and conditions that are most comfortable for them.

Practicality is the ease of users in operating anything in learning media, so that media assessors can find out the level of practicality of the product being developed (Astuti et al., 2023). There are several aspects that need to be considered that support learning media. First, the media is seen from the formats available and the time used. The second is suitability to students, namely the suitability of the media content to the students' development and experience and the third is suitability to the teacher, namely the suitability of the media to the learning carried out by the teacher and being able to facilitate students to understand the material through the media developed.

Validation of the Learning Motivation Questionnaire

The validation assessment of the learning motivation questionnaire was carried out based on three aspects, namely graphic, media and content aspects and content aspects. The assessment results obtained can be seen in table 7.

Based on the results of the validation of the learning motivation questionnaire, it was concluded that all the

statements made were valid and suitable for use in research. Statements are made in accordance with indicators of learning motivation, each item of the statement is presented clearly, the scale used for assessment is appropriate, the instructions for filling out the questionnaire are clear, the explanation of each statement uses language that is easy to understand and the language is appropriate to student development.

Table 7. Results of Validation of the Learning Motivation Questionnaire

Assessment aspect	Evaluation	Criteria
Graphic aspect	4	Very Worth It
Media and content aspects	4	Very Worth It
Content aspect	4	Very Worth It
Average	4	Very Worth It

The average score obtained from the three aspects of the learning motivation questionnaire assessment was 4.00 with very adequate criteria, so it was concluded that the learning motivation questionnaire was valid and ready to be used at the trial stage in class.

Implementation Stage

The implementation stage is the stage of applying a product that has been tested and declared feasible by experts and practitioners. This stage aims to determine the effectiveness of the product in increasing students' learning motivation on endocrine system material. The test subjects were 72 students of SMAN 1 Minggir who were divided into experimental and control classes.

Descriptive Test Results

Analysis of student learning motivation was obtained through a questionnaire with an assessment score range of 1-4. Data regarding measuring learning motivation is presented descriptively in the form of a table of average values (mean).

Table 8. Descriptive Results of Learning Motivation Data

Information	Control class		Experimental class	
	Pretest	Posttest	Pretest	Posttest
Minimum	46.25	65.00	45.00	73.75
Maximum	71.25	93.65	77.50	100.00
Mean	59.34	81.77	59.72	89.98

Based on Table 8, it can be concluded that the average the average student learning motivation obtained from the pretest and posttest results of the control and experimental classes showed that the control class obtained an average score pretest average of 59.34 and flat the average posttest score is 81.77, while for the experimental class the results were average the average pretest score is 59.72 and posttest of 89.98, it is known that a higher increase occurred in the experimental class.

Table 9 shows a comparison of the increase in student learning motivation in the control and experimental classes as measured using the N formula N-gain with the result that the experimental class experienced a more significant increase, namely 0.75 (high) compared to the control class of 0.55 (medium).

Table 9. Analysis Results N-gain Learning Motivation

Class	average	N-gain score	Criteria
Control	55.38	0.55	Currently
Experiment	75.08	0.75	Tall

Inferential Statistical Test Results

Normality Test

The normality test is carried out to find out whether the sample used is normally distributed or not. The data used are the results of the pretest-posttest on learning motivation in the control and experimental classes. To determine the normality of the data, the Shapiro Wilk test was carried out using SPSS Version 27.

Table 10. Normality Test Results

Tests of Normality				
	Class	Shapiro-Wilk		
		Statistics	df	Sig.
Motivation to learn	Pretest Experiment	.955	36	.148
	Posttest Experiment	.944	36	.067
	Pretest Control	.958	36	.190
	Posttest Control	.961	36	.223

Based on Table 10, it is known that the experimental class and control class, both in the pretest and posttest results, obtained Sig. > 0.05, which means that the data used is normally distributed.

Homogeneity Test

The homogeneity test is carried out to determine whether the variance or diversity of data from several groups is homogeneous or the same. Levene test SPSS Ver. 27 software was used to carry out homogeneity tests in this research. Homogeneity test results were taken from pretest and posttest data for the experimental class and control class. Data is homogeneous if Sig. > 0.05. The homogeneity test results are presented in table 11.

Table 11. Homogeneity Test Results

Test of Homogeneity of Variance					
Variable	class	Levene Statistics	df1	df2	Sig.
Motivation to learn	Pretest	1.836	1	70	.180
	Posttest	545	1	70	.463

Based on Table 11, the students' pretest and posttest results were obtained with sig. > 0.05, which means the learning motivation data used is homogeneous.

T-test

The independent sample t-test is used to find out whether there is a difference in the averages of two different samples. The main requirement in the independent sample t test is that the data is normally distributed and homogeneous. Testing was carried out from posttest data from the experimental class and control class. The basis for making decisions on the independent sample t-test is to compare the sig level (2-tailed). If the sig (2-tailed) value <0.05 then Ho is rejected and Ha is accepted. The research hypothesis is as follows:

Ho: There is no difference in learning motivation between control class students and experimental class students.

Ha: There are differences in learning motivation between control class students and experimental class students.

Table 12. Independent Sample T-test Results

Variable	F	Sig. (2-tailed)
Motivation to learn	.545	0.000

Based on Table 12, the sig value is obtained. 0.000 (<0.05), this shows that H0 is rejected and Ha is accepted, which means there is a difference in learning motivation between the control group and the experimental group, that the use of interactive learning media (Ensysmel) in the experimental group is proven to be more effective in increasing student learning motivation.

The increase in learning motivation in the experimental class was more significant than in the control class. This proves that Ensysmel media is good for use in learning. Interactive learning media provides benefits in learning, including focusing student attention, motivating students and increasing learning effectiveness.

Through the use of Ensysmel media, learning can be meaningful, that is, learning can not only increase knowledge of information in the form of theories and facts as the development of low-level cognitive aspects, but can also improve aspects of attitudes and skills. So it is concluded that Ensysmel media helps students to learn by attracting attention, focusing attention and making learning more effective.

Motivation to learn is really needed because it has a positive impact on learning activities (Zawacki-Richter et al., 2023). In line with the statement Curtis (2019), student motivation is the key to success when learning anything and is able to make students try hard. Strengthened by Mahri et al. (2020) that learning motivation influences the learning outcomes obtained by students.

Media use interactive learning increasing learning motivation through the constituent components in the media. The use of a combination of text, audio, video, images and animation creates interest for students in learning and makes the learning atmosphere less monotonous. Learning media containing images, audio and learning videos makes students more motivated and can develop their way of thinking through interactive activities. Narrated texts can also facilitate students who have visual and verbal learning styles (Rusli et al., 2017).

Learning media functions to channel messages that can stimulate the thoughts, feelings and desires of the audience (students) so that they can encourage the learning process in themselves. Everything that can convey and channel messages from sources in a planned manner so as to create a conducive learning environment where users can carry out the learning process efficiently and effectively (Munadi, 2019).

Learning using interactive media has an important role in the learning process. The use of interactive media can make students concept formation abilities faster than just hearing an explanation and can make the atmosphere in the class more active and fun. The results of research conducted by Rahman et al. (2021) explains that there is a positive relationship between learning motivation and student learning outcomes after using interactive learning media.

Evaluation Stage

Evaluation is carried out at every stage of development from analysis, planning, development and implementation. Evaluation from the analysis stage to the development stage aims to see the feasibility of the product. Evaluation at the implementation stage is an evaluation after the product has been tested in real conditions, namely in learning activities. This evaluation is to see whether the product is effective in increasing learning motivation as measured using a questionnaire sheet.

Conclusion

Based on the research that has been carried out, it is concluded that the development of Ensysmel media on endocrine system material is feasible and practical for use in learning activities based on the assessment of experts, practitioners and users. Independent Sample t-test test results obtained results0.000 < 0.05 and it is stated that the use of Ensysmel media has proven to be effective in increasing student learning motivation.

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The authors declare no conflict of interest.

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