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DEVELOPMENT OF INTERACTIVE LEARNING MEDIA BASED ON APPLICATIONS ARTICULATE STORYLINE 3 HUMAN COORDINATION SYSTEM MATERIAL

Nurul Fadhilah H.M[1], Andi Tenri Ola Rivai[2], Syamsul[3]

[1,2,3] Universitas Islam Negeri Alauddin Makassar, Makassar, Indonesia
[1]dilafadhilah2400@gmail.com, [2]andi.tenriola@uin-alauddin.ac.id, [3]syamsul.hamzah@uin-alauddin.ac.id

ABSTRACT

This research is included in the type of research and development or Research and Development (R&D) based on the ADDIE development model which consists of five steps, namely Analyze, Design, Develop, Implement and Evaluate. This study aims to develop learning media, determine the level of validity, level of practicality and level of effectiveness of media. This research was conducted at SMA Negeri 2 Takalar class XI Science 1 which amounted to 30 students. Media validity of 3.80 with very valid category. The practicality of the media obtained through teacher responses is 95.31% and student responses are 85.18% with very practical categories. Of the 30 total students, 27 of them obtained scores that were in accordance with the KKM target (90%) and 3 of them obtained scores that did not meet the KKM target (10%). The pretest score of students obtained is 28.13 while the posttest value is 81.33, so that the average N-gain score obtained by students is 0.72 and is in the category (0.7 g ≤ 1), it can be said that the increase in student learning outcomes is high.

Keywords*: *research and development; learning media; articulate storyline 3 app

PENGEMBANGAN MEDIA PEMBELAJARAN INTERAKTIF BERBASIS APLIKASI ARTICULATE STORYLINE 3 MATERI SISTEM KOORDINASI MANUSIA

ABSTRAK

Penelitian ini termasuk dalam jenis penelitian dan pengembangan atau Research and Development (R&D) berdasarkan model pengembangan ADDIE yang terdiri dari lima langkah yaitu Analyze, Design, Develop, Implement dan Evaluate. Penelitian ini bertujuan untuk mengembangkan media pembelajaran, mengetahui tingkat kevalidan, tingkat kepraktisan dan tingkat keefektifan media pembelajaran. Penelitian ini dilakukan di SMA Negeri 2 Takalar kelas XI IPA 1 yang berjumlah 30 peserta didik. Kevalidan media sebesar 3,80 dengan kategori sangat valid. Kepraktisan media yang diperoleh melalui respon guru yakni 95,31% dan respon siswa yakni 85,18% dengan kategori yang sangat praktis. Dari 30 total peserta didik, 27 diantaranya memperoleh nilai yang berada sesuai target KKM (90%) dan 3 diantaranya memperoleh nilai yang tidak sesuai target KKM (10%). Nilai pretest peserta didik yang diperoleh yakni 28,13 sedangkan nilai posttest yakni 81,33, sehingga rata-rata N-gain skor yang diperoleh peserta didik yakni 0,72 dan berada pada kategori (0,7 g ≤ 1) maka dapat dikatakan bahwa peningkatan hasil belajar peserta didik tergolong tinggi.

Kata Kunci: penelitian dan pengembangan; media pembelajaran; aplikasi articulate storyline 3

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INTRODUCTION

Education is a conscious effort made by educators to provide lessons to students with direction through various learning resources to achieve desired goals. Education in the 2013 curriculum applies a student-centered approach that involves students actively and creatively developing the knowledge and skills they learn (Rivai, 2019).

The development of the world of education and technology has now advanced, such as the use of technology that can support the learning process (Sobri et al., 2020). One of the learning processes in the classroom depends on the use of learning media. Learning media is a tool that is packaged in order to convey various information and is useful for stimulating student activeness in interaction. The selection of

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learning media is the selection of interesting learning aids and ensuring the exact type of media to be used, because the selection of learning media can affect the effectiveness of learning (Shafira et al., 2019).

The results of a student survey at SMA Negeri 2 Takalar showed that the use of textbooks had a higher percentage (61.7%), Powerpoint (18.3%), learning videos (16.7%), and Student Worksheets (LKS) (3.3%). In addition, the use of interactive technology-based learning media is still very lacking, especially in biology learning. Facts in schools show that students have been facilitated by technology, but initiatives from the use of technology-based learning media are still lacking. The type of learning media that is often applied is also dominant in using visual media, according to the survey results that the use of visual media in learning is 43.3%, the use of multimedia in learning is 38.3%, the use of audiovisual media is 13.3% and the use of audio media is 5.1%.

Not all material can be easily understood only by relying on visual media or print media, because biological materials, especially body system materials in the human coordination system, humans are included in the category of material that is difficult to understand. Based on the survey that the categories of material considered difficult for students are human coordination system material (20%), cell material (10%), genetic material (10%), mutation material (10%), biotechnology material (10%), excretory system material (6.7%), plant tissue material (6.7%), plantae material (6.7%), virus material (5%), animal tissue (3.3%), fungi material (3.3%), classification material of living things (3.3%), respiratory system material (1.7%), and biodiversity material (1.7%).

The reason students consider human coordination system material as material that is difficult for students to understand is because the characteristics of this material are classified as difficult, have many concepts that need to be understood, have many Latin terms, material that is abstract for students, and still lack supporting learning media. In line with research by (Sodiq et al., 2021) that the material of the human coordination system is classified as abstract material according to students, has many foreign terms, and the material is dense.

One example of interactive media that students can use is multimedia in learning. Multimedia is designedto be able to convey messages interactively to users. The Articulate Storyline 3 application is a multimedia authoring tool that is applied as an interactive one in the form of a combination of images, text, graphics, audio, video, and animation (Amiroh, 2019).

Articulate Storyline 3 is relatively easy to learn for beginners, especially for teachers who previously had the basis in creating learning media using Microsoft PowerStory, this is because Articulate Storyline 3 has features similar to Microsoft PowerPoint. The features contained in Articulate Storyline 3 are superior to being able to create and run interactive media, including timelines, triggers, layers, players that include menus, glossaries, slide notes, resources, navigation buttons and other components on the slide, as well as interactive quiz menus. Articulate Storyline 3 in its application does not need to use programming languages like making applications in general, making it possible for anyone to develop interactive learning media easily.

Learning using the Articulate Storyline 3 application independently or in groups becomes more interesting because it utilizes technology that is in accordance with the current conditions of students who are happy with the existence of technology. The advantage of this application-based interactive media is that it is very easy to use by students in any condition because it is e-learning-based. Multimedia learning can be used in learning both online and offline (Lestari et al., 2021).. In addition, it can also be aligned in the 2013 curriculum that learning activities must be student-centered. Through these problems, researchers hope that with the development of the Articulate Storyline 3 application media, it will be able to overcome the problems experienced by students.

REASERCH METHOD

The research carried out is included in the type of research and development or Research and Development (R&D) based on the ADDIE

Jurnal PAJAR (Pendidikan dan Pengajaran)
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development model consisting of Analyze, Design, Develop, Implement and Evaluate(Branch, 2009). This research was implemented at SMA Negeri 2 Takalar class XI MIA 1 with a total of 30 students. The instruments used include media validation sheets, RPP validation sheets, question validation sheets, and teacher and student response questionnaire validation sheets. The model used in this study is the ADDIE model according to figure 1.

The ADDIE Development Model is interactive through several stages of learning that are very dynamic, effective and efficient. The reason researchers choose the ADDIE model is because it can be used appropriately for various models, strategies, and learning media. In the ADDIE development, evaluation can occur at each stage with the aim of revision needs.

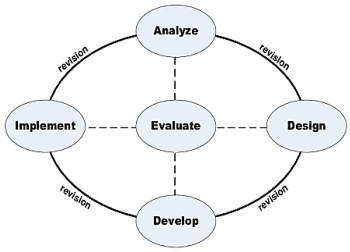

Figure 1. ADDIE Approach Flow
(Sugiyono, 2017)

Validity Analysis

Table 1. Validity Analysis

Value	Criterion
v > 3.4	Very valid
2.8< V ≤ 3.4	Valid
2.2< V ≤ 2.8	Quite valid
1.6< V ≤ 2.2	Less valid
v ≤ 1.6	Invalid

(Hartanto, 2020)

Practicality Analysis

Table 2. Practicality Analysis

Value	Criterion
81% - 100%	Very practical
61% - 80%	Practical
41% - 60%	Quite practical
21% - 40%	Less practical
0 - 20%	Very impractical

(Hasan et al., 2021)

Effectiveness Analysis

Table 3. Student Mastery Level Criteria

Value	Criterion
0 ≤ TPS < 40	Very lacking
40 ≤ polling stations < 60	Less
60 ≤ polling stations < 75	Keep

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75 ≤ polling stations < 90	Tall
90 ≤ polling stations ≤ 100	Very high

(Widoyoko, 2011)

The score obtained based on the pretest and posttest values is then calculated through the - test with the formula:

$$\text{N } gain = \frac{posttest \text{ value} - pretest\ value}{\text{maksimum value} - pretest\ value}$$

These results will then be grouped based on criteria for improving learning outcomes.

Table 4. N-gain criteria

Value	Criterion
N < 0.3	Low
0.3 ≤ N < 0.7	Keep
N ≥ 0.7	Tall

Students are said to be successful in the learning process if they get the learning results obtained according to the school's Minimum Completeness Criteria (KKM), which is 72. The accumulation of *students' pretest* and *posttest* scores is at least in the interval 0.3 ≤ N < 0.7 with the medium category.

RESULTS AND DISCUSSION

Result

The analysis carried out was about the problems found, namely schools lacking biology learning media. The lack of learning media makes students feel quickly bored and bored in the learning process. This is in line with research by Sulistyorini (2010) that the lack of media used in learning can cause a lack of student ability and knowledge so that students feel quickly saturated in learning. Especially in body system material such as the human coordination system which according to students is material that is difficult to understand due to too many concepts and is abstract, and has many foreign terms that make students not interested in learning the material. In addition, teachers lack learning media, especially interactive learning media. Students have been facilitated in using technology, especially the use of mobile phones in learning. Through observation, all students already have mobile phones and this has become a major need for them, but the dominant learning media used is still print-based media such as the use of package books. Not all students also have package books because the availability of package books in limited quantities so they have to take turns to borrow at the library. Products developed to solve problems are interactive media. Students will use interactive media as technology-based media. The interactive media developed is by using the Articulate Storyline 3 application which has the ability to accommodate user responses. This response accommodation activity consists of user control in running interactive media and feedback from the program being run, so that students can be central in learning and can become more independent because students are trained to search, find and solve problems based on the results of their findings.

In design stage, researchers make an outline picture of the content of the media to be developed consisting of content components and construct components. Content components include the front cover, login page, home menu, learning outcomes in the form of KI, KD and learning objectives, material menus, term dictionaries, learning videos, interactive quizzes, and developer profiles. While the construct component is the design program used, where the main application in making interactive media is the Articulate Storyline 3 application. The media

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storyboard created in the Articulate Storyline 3 application can be seen in Figure 2.

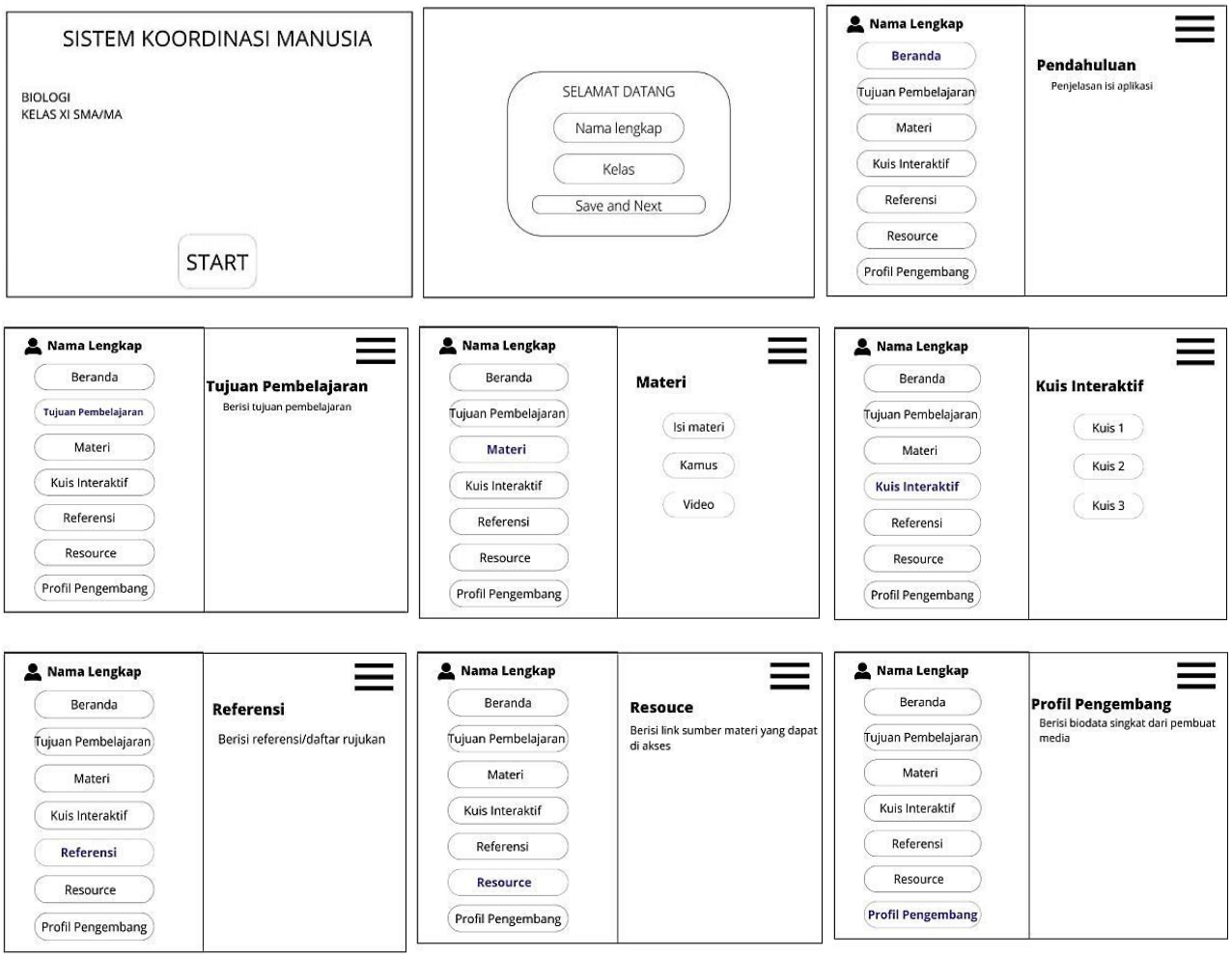

Figure 2. Storyboard Articulate Storyline 3 Application

The font that researchers use in the application is the Serif font in the title of the writing and the content of the material. The font size for the heading is 18, the font size for the subheading is 14 while the font size of the writing on the material is 12. On the quiz, the font used is Sans Serif. Each menu option that exists, presents contents that match the name of the menu so that it uses the user in its application.

At the develop stage aims to create and modify learning media until it is ready for the trial stage. Theconceptual concept that has been designed in the previous stage is then developed so that it is then ready to be applied. The result of the develop stage is a product that is ready to be tested to determine validity by both validators. At this stage, it starts with preparing materials and tools including material description, quiz questions that will be included in the media, and software that will be used to produce interactive learning media. Supporting applications include PixelLab and Canva to design the visual appearance of the product, such as backgrounds and create icons for media application buttons to be created. In addition, the learning videos that want to be displayed in the media are the adoption

Jurnal PAJAR (Pendidikan dan Pengajaran)
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of Youtube which is edited and combined according to the material. Table 6 is the result of media development using the Articulate Storyline 3 application.

Table 6. Results of Articulate Storyline 3 Application Media Development

Tampilan	Keterangan
	App intro
	App login
	Application introduction

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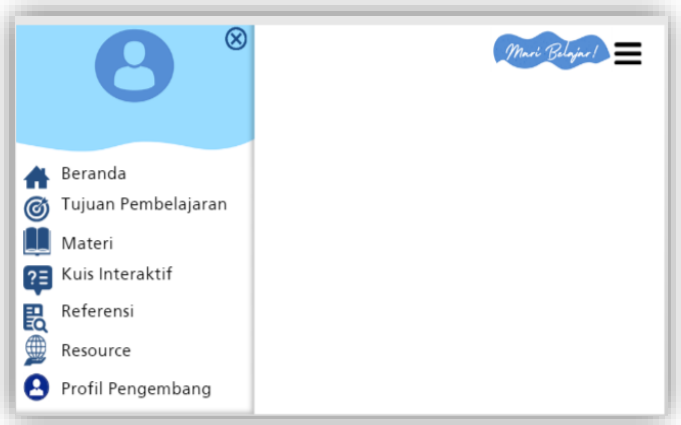
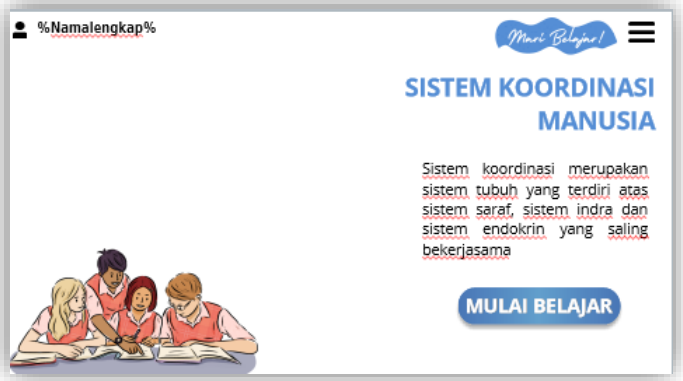
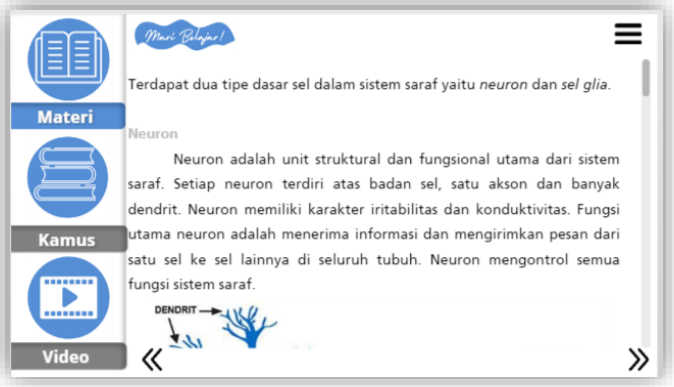


Study menu options



Start learning view



Display of material content

Jurnal PAJAR (Pendidikan dan Pengajaran)
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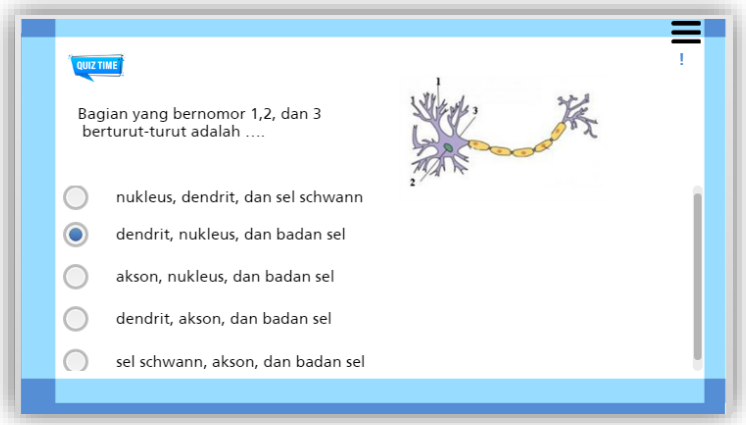

Quiz review

Products are checked in advance for deficiencies in the developed media. Checking starts from the completeness of the content of the material, appearance, language used, video quality, and audio quality before the product is implemented. After the repair process is carried out, the media is then published in .exe format so that it can be opened and used on laptops or other computers that do not have *the Articulate Storyline* 3 application installed. Furthermore, interactive media based on *the Articulate Storyline* 3 application were validated by validators. Through the results of the validation, revisions are carried out until the resulting product is declared valid and can be implemented in the learning process.

In the *first* stage of *mplement*, the implementation of product design will be carried out in learning as in classroom situations. The product was tested in order to determine the level of practicality based on the questionnaire of educator and student responses. The interactive media implementation stage is carried out to measure student learning outcomes by providing *pretest* and *posttest*. The implementation of the product was carried out on 30 grade XI students at SMA Negeri 2 Takalar. The stage of implementation is the *Articulate Storyline* 3 learning media that has met the valid criteria and then tested by preparing targets, namely educators and students. The end result of the implementation phase is a ready-to-use *Articulate Storyline* 3 application product.

At the *evaluate* stage, it is very meaningful in evaluating any shortcomings of learning media. The evaluation carried out is a formative evaluation, where the product is re-revised based on comments and suggestions obtained at the implementation stage, these suggestions include the source used in the image reference written using the italic format, images on nerve cells need to be replaced or use images with better resolution and proportion, add reference sources to learning videos, add vocabulary to the dictionary of terms, The content of the material you want to highlight should use *italic* / *bold* format.

Validity Level of Interactive Media Based on Articulate Storyline 3 Application

Table 7. Analysis Results Media Validity

Assessment Aspect	Valuation	Category
Display	3,86	Highly Valid
Content	4	Highly Valid
Video Quality	3,83	Highly Valid
Audio Quality	4	Highly Valid

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Language	3,66	Highly Valid
Ease of Use of Media	3,49	Highly Valid
Average	**3,80**	**Highly Valid**

Practicality Level Interactive Media Application-Based Articulate Storyline 3

Table 8. Results of Analysis of Teacher and Student Responses to Media

Types of Assessments	Average	Judging Criteria
Teacher response	95,31%	Very Practical
Student response	85,18%	Very Practical

Level of Effectiveness of Interactive Media Based on Articulate Storyline 3 Application

Table 9. Percentage of Student Learning Outcomes

Score	Criterion	Total
72-100	Complete	27 students
0-71	Incomplete	3 students
Sum		**30 students**

In order to be able to compare students' grades before and after the learning process, it can be calculated using the N-gain value as in Table 10.

Table 10. Student N-Gain Analysis Results

Treatment	Average score of students
Pretest	28,13
Posttest	81,33
N-Gain Score	**0,72**

In addition, the results of the analysis of student learning activities also affect the level of student mastery in following learning, can be seen as in Table 11.

Table 11. Results of Student Learning Activity Analysis

Criterion	Percentage (%)
Stating thoughts	55,56
Accept other people's thoughts	66,67
Teamwork with groups	85,56
Listento the explanation of friends and teachers	83,33
Create a summary of material	91,11
Anntusias in learning	88,89
Average	**78,52**

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Discussion

Aspects of appearance, content of material, video quality, audio quality, language and ease of use of media obtain very valid results. This means that application-based media has generally met the expected criteria. The validity of this media can be supported from the aspect of appearance, seen in terms of color selection used in developing dominant applications using blue. Blue color is able to produce a feeling that calms the soul and is comfortable, besides that we can find it in everyday environments. Blue is also able to give meaning to elements of mediation or relaxed feelings (Cholilawati, 2021).

In addition to using blue, it also uses a black intro. This black color is one of the colors preferred by teenagers aged around 16 years to 25 years. Some of those who are ambitious and achievement-oriented also like the color black (Huda, 2019). While the font used for media content is a serif font. This type of font is able to make people comfortable in reading text even if it is more than one line of text. Long writing can also use Serif type fonts (Thouids, 2015)

It is also supported by the quality of the video displayed. The video quality used is 1280x720p. According to Enterprise (2021), better video quality can use a video resolution of at least 720p. The higher the video resolution used, the sharper the quality is also clearer. The audio quality aspect is classified as very valid with an average score of 4. This is also supported by the audio quality used, which uses MP3 files with a minimum audio quality of 128 Kbps. According to Stephen (2007) that audio bit rate can determine the quality of the audio. The higher the bitrate, the better and less noisy the audio quality. In general, the most commonly used bitrate for MP3 files is the 128 bit rate, if you want better audio quality you can use 192, 256, and 320 bitrates. For aspects of sound quality used is also classified as appropriate and appropriate and does not interfere with the presentation of the material.

The aspect of language use gets an average score of 3.66, which is in the very valid category. This is in accordance with the language used is easily understood by users and is appropriate for the use of PUEBI, but there is a need for more communicative vocabulary selection in conveying media content. The aspect of ease of use of media obtained an average score of 3.49 with a valid category. This is because the application that will be installed on Android needs to be installed first using the network, after the installation process is complete the application can be accessed even offline. Learning media developed is classified as very valid. This is in accordance with Dwijayani's theory (2017) if the average value has reached the good category, then the media developed has been valid and considered suitable for use.

The level of practicality of the developed media is obtained through the results of questionnaire analysis given to students and teachers. The response from the use of media by teachers obtained 95.31% results, which included the very practical category and the response through the use of media by students was 85.18 with a very practical category. This was also stated by Safitri et al., (2022) that the practicality of the learning media developed is determined by the scores of student respondents. Practicality can show feasibility on media that have been developed.

The practicality of the *Articulate Storyline* 3 application media is because there is a menu that is able to represent the components depicted. Properly listed menus can make it easier for students to find the desired content quickly. The menu consists of a home menu, a materials menu, a quiz menu, a dictionary menu, and a learning video menu. In accordance with what was stated by Dwijayani (2017) that media practicality can also be assessed through two aspects, namely ease and usefulness. The ease of media can be seen from the ease in the operation process and ease in the maintenance process. While the benefits of media are seen from the extent to which the media is able to provide facilities to students in order to master the content of the material, can make students learn independently, and can help student focus through the learning process. In addition, the existence of audio-visual media such as learning videos contained in the application can help students understand the material taught.

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The level of effectiveness of the media is known at the implementation stage by providing *a pretest* before using the media or given treatment and *posttest* after using the media. The learning outcome test consists of 20 questions with multiple choice type with research subjects of 30 students of grade XI MIA 1 SMA Negeri 2 Takalar.

Based on 30 total students, 27 of them obtained scores above KKM with a percentage of 90% and 3 of them obtained scores below with a percentage of 10%. The KKM score set in class XI biology subjects at SMA Negeri 2 Takalar is 72. Students can be said to be complete in learning if they obtain a score greater than the KKM score (Setiyadi, 2017) According to Hobri (2010) stated that learning can be said to be effective if in general 80% of students can get grades with a minimum of medium category or 80% of students can achieve a minimum score of 60. Ifan aspect requirement has not been met, a review through retrial is needed in the learning process. So, it can be said that interactive multimedia based on the *Articulate Storyline* 3 application is effectively used in the learning process. Haviz (2016) also said that the media developed can be declared effective when testing student learning outcomes according to the achievement of learning objectives.

In addition, an N-Gain Test is also carried out in order to determine the results of learning improvement before and after the use of learning media is applied. The number of students with high N-gain scores (gain > 0.7) was 19 students and the medium category (0.3 < gain > 0.7) was 11 students. Based on the average N-gain score obtained by 30 students, which is 0.72 and is in the category (0.7 < gain ≤ 1) so that it is stated that the N-gain of student learning is high. Learning using the *Articulate Storyline* 3 application can make student learning outcomes increase, as stated by Hidayati (2017) stated that multimedia used in learning is considered more effective than if only conventional learning is carried out. This is evidenced by the average score of the experimental class test results (78.67) higher than the average score in the control class.

The average result of student learning activities is 78.52% which includes aspects of students in expressing thoughts, accepting other people's thoughts, collaborating with fellow groups, listening to explanations from friends and teachers, making material summaries, and being enthusiastic in learning. In this case, the criteria that are less than learning are expressing thoughts only by 55.56% and accepting the thoughts of others only by 66.67%. As for other criteria, it is classified as high such as collaborating with fellow groups by 85.56%, paying attention to the explanations of friends and teachers by 83.33%, making material notes by 91.11%, and following the learning process enthusiastically by 88.89%. Effective learning can make students successfully achieve learning goals. In addition, it is also able to provide new experiences and shape students to be independent (Damopolii et al., 2019).

CONCLUSIONS AND RECOMMENDATION

Based on the results of research that has been conducted, interactive learning media based on the Articulate Storyline 3 application on class XI human coordination system material at SMA Negeri 2 Takalar obtained excellent research results on the level of validity, level of practicality and level of media effectiveness. This means that the media that has been developed is feasible because it is classified as very valid, very practical and very effective to be applied in the learning process in the classroom. This application is able to provide learning motivation to students so that they are not easily bored in learning and are adjusted based on educational needs and challenges, especially in the fields of technology and science.

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