DEVELOPING INTERACTIVE MEDI A WITH ARTICULATE STORYLINE 3 FOR ENHANCING STUDENTS' LEARNING MOTIVATION ON NEWTON'S LAWS

RESEARCH ARTICLE

FADILLAH EKA NURANISA
University of Bengkulu, Bengkulu, Indonesia
Corresponding author: fadillanuranissa@gmail.com

ANDIK PURWANTO
University of Bengkulu, Bengkulu, Indonesia

EKO RISDIANTO
University of Bengkulu, Bengkulu, Indonesia

Abstract

The learning motivation of grade XI students of SMAN Bengkulu still needs to be improved. This can be seen from the analysis of student needs that were previously carried out with the results that there are still many students who do not understand physics material because they are still lacking in the use of software-based media. This study aimed to determine the development of Articulate Storyline-assisted media to increase students' motivation to learn Newton's law material. Research and development is a type of research that is being carried out (*Research and Development*). This study used *the ADDIE model*. This model consists of stages (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. The subjects of the study were 33 students in grade XI.2 of SMAN Bengkulu. Data analysis included analysis of learning implementation, media feasibility, student response, and student learning motivation. The results of the research showed: (1) The results of the media feasibility test by the three validators obtained an average percentage value of 85.30% which shows that this learning media is very feasible to use. (2) In the results of the student response, a score of 86.56% was obtained so it was classified as very good. (3) In the results of student learning motivation in the initial motivation with a percentage of 73.86% with the category "Motivated" and in the results of the final motivation questionnaire obtained results with a percentage of 93.29% with the category "Highly Motivated".

Keywords: ADDIE, interactive learning media, motivation, newton's law.

Introduction

Education can produce good human resources by increasing everyone's potential and preparing them for future challenges. Sabrina and Russanti (2022). Educators must adapt to changes in the era of the Industrial Revolution 5.0. The learning system of the previous stage will be different from the current learning system. The first system uses a more conventional approach, so teachers stay focused on the learning process (Feri & Zulherman, 2021). In modern education, teachers are no longer the

center of learning; students must play a more active role in the learning process. Information technology as a learning tool is increasing as a result of more creative and innovative learning (Dewi et al., 2021). The main question for educators is how best to activate early knowledge in their students. Various approaches should be included. When teachers create lessons, activities, and discussions that reflect their goals for teaching, they must also change to adapt to what students are learning. This is because, in the 21st century, students must be able to keep up with the times (Azizah et al., 2020). Learning is a system comprising many components that interact with each other. Good learning pays attention to how it is planned and done. Educational objectives, students, materials or subjects, approaches and methods, media, learning resources, and evaluation are the components of learning, Learning resources are one of the components (Putra, 2022).

Science and technology (IPTEK) are developing rapidly and becoming more sophisticated, developments in the field of education are closely related to science and technology. This is now a problem in the world of education. To choose an effective method of education, teachers must understand the nature of each generation. They must also look at how students interact with each other, learn, and blend digital and physical components of their lives. Understanding the characteristics of each generation will help teachers choose learning models and approaches. Technology has become an essential component of classroom teaching and learning. The teaching and learning process in schools is currently changing as a result of technological advances, especially those that are used as learning media (Adawiyah & Dalimunthe, 2022).

The characteristics of students who sit in high school tend to have a low level of thinking ability and a simple mindset so they need to be guided gradually to improve their thinking skills. In daily life, students must be able to explore and master students understanding, understanding, and skills in solving problems in daily life. Given that critical thinking skills are essential for student learning, especially in physics studies, teachers should constantly check their students' thinking skills. According to Hadinoto et al. (2023) Physics is a branch of science that studies real things and can be mathematically proven with formulas. Most students consider physics to be one of the most difficult subjects. As a result, many students are unhappy even if they don't take physics classes.

Based on the findings of teacher interviews and the distribution of questionnaires analyzing student needs at one of the high schools in Bengkulu City. When asked to explain the subjects they have learned, students seem confused because they do not listen to the explanations and believe that the learning process is too boring, making it very difficult for them to understand the concepts. This is certainly a tough challenge for the teacher. Learning activities often use the Problem-Based Learning method and work on printed LKPD designed from *the Canva application*, so students are not interested in paying attention to the explanation from the teacher and tend not to repeat the learning material that has been explained. This provides a conceptual understanding that has not been maximized in each learning material.

The solutions offered are engaging learning and interactive media to understand physics. Information and communication technology (ICT) media can overcome the problem of learning abstract physics by displaying images in the form of animations and videos, With dynamic and static visualization, this learning media can make abstract concepts real Caesaria et al. (2020). ICT media is useful in making it easier to convey abstract messages in the form of an attractive and interactive website. One of the subjects known for its abstract concepts is physics. The laws and concepts of

physics are abstract, so it is an obstacle for teachers to deliver material to students. Not all physics concepts can be tried in the lab because they are abstract.

Learning physics on your own requires a high level of focus. If the delivery of the material is considered too monotonous, then students will quickly get bored and eventually the material cannot be delivered properly. Many teachers do not realize that if the delivery of material is too basic, such as only explaining through books without being balanced with interesting things, it will be more disturbing and burdensome to students' minds. So the main purpose of using this software is to produce interactive learning media for students and teachers themselves. That way, it can help in conveying learning for teachers and understanding learning for students. These learning materials will be packaged in a way that is not only effective and efficient but also engaging, ensuring that students are motivated to explore the content. By using innovative design elements, interactive features, and real-life examples, the media will capture students' attention and cater to different learning styles. The goal is to make complex concepts more accessible, breaking them down into manageable and digestible parts that students can relate to. A successful learning process should be fun, demanding, and inspiring, and give students more freedom to be creative and independent according to their interests and skills (Pratama et al., 2022). An educator must be qualified to develop information and communication technology media on target so that the teaching and learning process of physics in the classroom becomes interesting and provides an accurate picture and deep understanding (Astuti et al. 2021).

Articulate Storyline is software that can be used to create presentations. *Articulate Storyline* has the same function as Microsoft PowerPoint. *Articulate Storyline* has several advantages so that it can produce a more comprehensive and creative presentation. Certain advantages can be found in *the Articulate Storyline 3 Software*, one of which is the easy-to-use *timeline, movie, image, character*, etc. features (Kemendikbud, 2016). The use of interactive media based on *Articulate Storyline* can facilitate the learning process and increase teachers' creativity in interactive and communicative learning designs. This medium can be used as a problem-solving technique. amid busy teachers today. Another method to improve the quality of learning and offer many possibilities for the process is to use media that are based on articulated stories (Adiyatma & Diyana, 2024). Therefore, the purpose of this study is to create interactive learning media by using *Articulate Storyline 3 Software* to increase the motivation of high school students towards Newton's Law, to determine the feasibility of Articulate Storyline 3 software-based learning media, student responses to interactive learning media using *Articulate Storyline 3 Software* and to increase student learning motivation.

Literature Review

Physics learning in Schools

Learning is the process of building an atmosphere that allows learning to take place and change student behavior. These days, learning through videos is becoming more and more interesting. It covers a wide range of learning topics, including physics, and is accessible at many levels of education, from elementary school to college (Hafizah, 2020). One of the abstract sciences that needs to be looked at is physics, therefore learning resources are needed to help students understand the material. The lack of a variety of learning materials used by teachers is one of the factors that affect physics

learning outcomes in addition to students' perception of physics as a challenging topic. Physics is one of the subjects that students avoid the most. Students find it difficult to understand concepts and consider physics as a difficult topic due to a large number of formulas, difficult tasks, and uninteresting material (Rahmawati et al., 2022). An important part of the teaching and learning process is educational media (Wulandari et al., 2023). In learning, teachers usually use learning media as an intermediary in delivering material so that it can be understood by students.

Technology-based learning media

According to Dewi et al. (2021) Learning media is a tool that teachers can use to make learning content easy for their students to understand. The development of technology-based learning media has become the focus in the world of education, especially in facing the demands of 21st-century learning. One widely used software is *Articulate Storyline*, which is known for its ability to create interactive and accessible learning modules. Literature studies on the development of *Articulate Storyline-assisted* media provide insight into the content generated and the research approaches used to ensure the media is effective.

Articulate storyline

Articulate Storyline allows for the development of learning materials that are more engaging, effective, and relevant to the needs of students. This learning medium is often used to convey abstract material, such as science, math, or technology concepts, with the help of animation and simulations that increase visual appeal. Additionally, interactive features such as quizzes, drag-and-drop, and audio narration allow students to actively participate throughout the learning process. Adaptation to learning styles is also a key advantage, where this media can be designed to meet the needs of visual, auditory, or kinesthetic learning styles. Scenario-based content or case studies are also often integrated, providing a contextual learning experience that is relevant to the real world.

Development of articulate-assisted learning media storyline 3

The development of Articulate Storyline-assisted learning media often uses a Research and Development (R&D) approach. The ADDIE (Analysis, Design, Development, Implementation, Evaluation) model is one of the most popular frameworks, due to its systematic and flexible process. This step begins with an analysis of student needs, followed by module design, media development, implementation in small or large groups, and evaluation to determine its effectiveness. In addition to ADDIE, 4D (Define, Design, Develop, Disseminate) and Borg and Gall models are also widely used in research. Product trials are a key step in this process, involving the participation of students and teachers to get feedback that can improve the quality of the media.

Using learning media is one of the techniques to improve learning activities; This will significantly help the learning process and communicate the message and content of the material effectively. However, because media has many characteristics, it needs to be carefully selected to be used appropriately (Kami et al., 2023). Considering previous research conducted by Adiyatma and Diyana (2024). The creation of physics education materials based on a clear storyline in straight-

motion subjects. A study on the creation of a coherent media narrative about straight movement. In addition to *Research and Development* (R&D) techniques, this research uses the ADDIE (*Analyze, Design, Develop, Implement, and Evaluate*) development methodology. An 82 percent success rate was achieved in the feasibility test of interactive learning materials based on Articulate Storyline using straight-motion content. The student's response to the learning material received an evaluation of 85 percent with very good criteria. We can conclude that it is very feasible to use interactive educational resources that are based on compelling narratives.

Articulate Storyline provides several significant benefits in learning, especially in increasing student interactivity and engagement. Modules created with this software allow for self-paced learning, where students can access the material on their schedule. In addition, research shows that media designed with Articulate Storyline can improve memory and concept comprehension due to the use of visual elements and in-depth narratives. Features such as quiz integration also help teachers in measuring student learning outcomes directly.

Despite its many advantages, the development of Articulate Storyline-assisted media faces several challenges. One of the main obstacles is the technical skills required to create attractive and functional modules. Not all teachers have the access or ability to use this software to its fullest. In addition, the limitations of technological infrastructure, such as hardware and stable internet connections, are also an obstacle in some areas. In the context of research, ensuring the validity and reliability of media requires a comprehensive experimental approach, which requires considerable time and resources. The development of Articulate Storyline-assisted learning media can be directed to more advanced educational technology innovations. Integration with artificial intelligence (AI), for example, allows personalization of learning according to individual needs. In addition, research can be focused on developing media for inclusive education, such as tailoring modules for students with special needs. Further studies also need to be conducted to evaluate the effectiveness of this medium in different fields of study and levels of education, ensuring that this technology is widely adaptable. Articulate Storyline offers great potential to improve the quality of learning through interactive, flexible, and effective media. The R&D-based approach ensures that the media produced can meet the learning needs and have a positive impact on student learning outcomes. By overcoming existing challenges, the development of Articulate Storyline-assisted media has a bright future in supporting the transformation of technology-based education.

Learning motivation

Student learning motivation is an important element that affects the success of education. According to various studies, learning motivation can be divided into two main categories, namely intrinsic and extrinsic motivation. Intrinsic motivation comes from within students, such as the desire to understand material or achieve personal goals, while extrinsic motivation is triggered by external factors, such as gifts or praise from teachers. Both play a role in increasing student engagement in the learning process, where highly motivated students tend to show greater effort and better learning outcomes (Emda, 2018). The factors that affect students' motivation to learn are very diverse. Students' ideals and aspirations are an important driver in building motivation, where clear ideals can strengthen the desire to learn both intrinsically and extrinsically. In addition, students' abilities also play a role; Students who feel capable tend to be more motivated to learn. A student's physical and

mental condition, as well as their social environment, including support from parents and peers, also greatly affect their level of motivation to learn (Muhammad, 2016). To increase students' motivation to learn, the role of teachers is very crucial. Teachers need to create a fun and supportive learning atmosphere, as well as explain the learning objectives clearly so that students have a clear direction in learning. The use of reward and punishment methods can also be effective in encouraging student motivation; Rewards can increase enthusiasm and interest in learning, while constructive punishment can encourage discipline. Thus, the right strategies in teaching can help increase students' motivation to learn and ultimately contribute to the achievement of optimal learning outcomes (Kasrina, 2023).

Methodology

Research design and approach of the study

The type of research that will be carried out is the type of research and development *(Research and Development). Research and Development* (RnD) is a research method used to produce a certain product and test its effectiveness. The data collection technique carried out to test the feasibility of the media is by conducting a validity test through 3 validators consisting of 2 expert lecturers in Physics Education, and 1 physics teacher and testing the effectiveness of the product through 33 students in grade XI.2 of SMAN Bengkulu.

ADDIE stands for Analyze, Design, Develop, Implement, and Evaluate, according to Hidayat (2021). The idea of the ADDIE model to create a learning product design is used to improve fundamental learning performance. Reiser and Molenda created ADDIE in 1990. However, they both use different formulas for ADDIE visualization. Reiser's formulation of ADDIE in Hidayat and Nizar (2021) using verbs (Analyze, design, develop, implement, evaluate).

This research consists of 5 stages, namely the analysis stage, design stage, manufacturing stage, testing stage, and evaluation stage. The analysis stage carried out is an analysis of student needs using student needs questionnaires, observations, and teacher interviews which are directly carried out at SMAN Bengkulu. From the analysis carried out, it was found that most teachers still use less interesting and interactive media for their students. So that it feels monotonous and boring in learning activities. Then the design stage is carried out based on the results of the needs analysis and continues with the selection of the media color theme to be made and the layout. The stage of creating interactive learning media is carried out with the help of *the Articulate Storyline 3 software*.

Data collection and analysis

The initial draft of the interactive learning media based on *Articulate Storyline* consists of several contents/contents, namely *the opening/login* page and the home page which contains basic competencies, materials, and practice questions. The process of making this media is carried out based on the design made in the previous stage. The next stage is *the development* stage. The *development* or testing stage of learning media is carried out through a validation and feasibility process by expert and practitioner validators consisting of 2 expert lecturers and 1 physics teacher at school. In the next stage of the implementation stage at this stage of media that has been created and has passed the media feasibility test will be implemented by students to see how students respond and increase student

learning motivation after using the media, and the last stage of evaluation at this stage uses formative evaluation which is one of the important components of the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). This evaluation is carried out at every stage in the development process to ensure that the resulting product is by the learning objectives and user needs before being widely implemented. With an iterative approach, formative evaluation helps to identify and improve weaknesses gradually, thereby improving the final quality of the learning product.

The method used in this study to collect empirical data for research is known as data collection techniques. Questionnaires, observations, interviews, and literature reviews are the methods used to collect data. Finding and reading previously published written material, such as books or other works that explain the theoretical foundations, is the process of gathering data for literature study. The same is true when collecting data and information through knowledge exploration or from sources such as books, papers, and various other sources relevant to the research topic. On the other hand, direct observation of field objects is known as observation. An interview is a data collection method that involves a one-way oral question-and-answer exchange in which the interviewee provides an answer and the interviewer asks a question. Interview and observation sheets are used in the data collection process. The purpose of the questionnaire is to collect data on students' reactions to the media created and their enthusiasm for learning.

Research site and participants

A sample is several characteristics that a population has, researchers can use samples taken from the population Sugiyono (2017). The sample in this study consisted of teachers and 30 students who had low, medium, and high abilities from class XI of SMAN Bengkulu City. This sampling aims to obtain information about the research object and be able to provide an overview of the population.

Results

Learning implementation analysis

With the use of Articulate Storyline 3, this study created an interactive learning medium for high school students studying Newton's laws that can be accessed online. This study uses the ADDIE model as a guide in the process of making learning media. In the Implementation Analysis Stage in the classroom, it was found that 61.66% of students stated that they did not understand or enjoy the physics lessons taught in class. Students need physics learning materials that can increase their learning motivation so that they can understand the topic more easily, based on the results of the study of the need for learning materials to increase student motivation, the percentage of results is 81.90%. A percentage of 81.07% was obtained, categorized as students who need and like non-print learning media that can be accessed anytime, anywhere, and of course practical.

The results of the analysis of learning activities from physics teacher interviews show that classes X and XI have implemented the Independent Curriculum while class XII is still implementing the 2013 Curriculum. Student motivation in teaching and learning activities is considered quite good but still needs to be improved. The results of the school's observations found that the school facilities

were good, where there were good internet facilities, infocus facilities, adequate speakers, and students were given the freedom to carry mobile phones in the classroom.

Media design stage analysis

During the design phase, researchers select components of the learning media and create an evaluation tool to evaluate the results. The product design is designed into the beginning, core, and cover. This interactive learning media assisted by *Articulate Storyline* can be accessed via the link: https://hukumnewton.my.id/materiku/hukumnewton1,2&3/. The purpose of these articulation-assisted learning resources is to provide an interactive learning experience to students. In this interactive learning media, students can access anywhere by using a mobile phone or laptop with the help of an internet network. This learning media includes learning videos, animations, and quizzes so that students can view the content, watch learning videos, and complete quizzes using learning media.

Media development stage analysis

At this stage, the entire product is produced. This product is made in 16:9 size with the Articulate Storyline 3 app. Text, images, videos, and animations are combined in each scene according to the storyboard design. The learning media is stored in HTML5 form. Furthermore, the HTML5 file is converted into a link so that it can be accessed online through a mobile phone or laptop with the help of the Cpanel and Domain platforms. Furthermore, a validity test was carried out by material experts, media experts, and linguists with 2 expert lecturers and 1 Physics teacher with validator 1 Mr. Drs. IK, M.A., Ph.D. Validator 2 Mrs. DHP., S.Pd., M.Si, and Validator 3 Mrs. SR, M.Pd. The assessment was carried out using a questionnaire for each expert. At this stage, there are media inputs and suggestions developed by experts, namely correcting words from Indonesian, changing some images and animations in the title of the material, adding buttons, adding sentences to instructions and some buttons, and changing the font size. At this stage, validation is carried out on the media being developed. The results of media validity are shown in Table 1.

Table 1. *Test the validity of content, media, presentation, language and learning motivation*

Name	Indicators				
	Contents	Presentation	Linguistics	Motivational	Media
Validator 1	75%	100%	75%	75%	75%
Validator 2	71,87%	50%	100%	91,67%	75%
Validator 3	96,87%	100%	100%	100%	100%
Average	81,25%	83,33%	91,67%	88,89%	83,33%

According to the evaluation findings of the three experts, the presentation component has a percentage value of 83.33% the content component has a percentage value of 81.25%, the language aspect of 91.87%, the media aspect of 88.89%, and the learning motivation aspect of 83.33% because the three experts provide relevant assessments on each question item. percentage indicates the "Highly

Valid" category. Therefore, this product is said to be very valid for use in teaching and learning activities

Implementation stage analysis

The Implementation Stage is carried out by testing students who are used in several meetings of class materials, especially Newton's law material. The implementation stage was carried out on grade XI 2 students with a total of 33 students. The courses involved are students who have high, medium, and low abilities. The results of the student response test to the media received an average score of 86.84% so it can be interpreted as "Very Good" whereas in the book of Sugiyono (2017), it is believed that the very good group includes a score between 81 and 100 percent. Table 2 displays the findings of the test of the student's response to the media.

Table. 2 *Results of student response test to media*

Aspects	Percentage	Middle
Serving	87,29%	
Material	85,85%	86,56
Benefit	85,51%	

The results of student learning motivation research for physics material, especially Newton's law material, in the results of the initial motivation questionnaire, obtained a percentage of 73.86%, this can be categorized as student motivation at the beginning before the media is given, namely "Motivated" where this can be seen in the book Sugiyono (2017) said that the motivation category includes those who have a score range of $61 \leq P \leq 81\%$. According to research on students' motivation to learn physics content, specifically Newton's law content, the final motivation questionnaire produced a percentage result of 93.29%. This can be classified as student motivation after media exposure, especially "Highly Motivated", as stated in the book Sugiyono (2017) with a score range of $81 \leq P \leq 100\%$ included in the motivated category. Table 3 displays the findings from the student learning motivation survey.

Table 3. *Initial and final motivation questionnaire results*

Indicators	Percentage Initial motivation	Percentage Final Motivation	Groups
The existence of a desire and desire to succeed	76,51	93,93	Highly
There are hopes and aspirations for the future	76,89	92,22	Motivated
There is a drive and need to learn	72,72	93,56	
There is a reward in learning	74,62	93,18	Highly
The existence of a conducive learning environment	76,36	93,33	Motivated
There are interesting activities in learning	76,13	93,56	

After obtaining the percentage of Initial Motivation and Final Motivation of the student learning motivation questionnaire, the researcher recalculated in the form of N-Gain in this case using SPSS to see the extent to which the average was obtained from the results of the Initial Motivation and Final Motivation, in this case using the following equation

$$N-Gain\frac{Final\ Motivation-Initial\ Motivation}{Score\ Ideal-Score\ inal\ Motivation}x100\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..\ldots\ldots.(1)$$

In contrast to the average of 0.7 in the interpretation of N-Gain with the High category, the average value of N-Gain, as determined by the N-Gain result, is 0.7163. This shows that the results of the "High" category have improved between the first and last motivation surveys. According to Wahab et al. (2021), there are four N-Gain criteria: $0.3 \leq g \leq 0.7$ medium category, $0 < g < 0.3$ low category, $g \leq 0$ failed category, and average $g > 0.7$ high category. Therefore, the N-Gain results are included in the high criteria based on this criterion. Table 4 displays the findings of the N-Gain test.
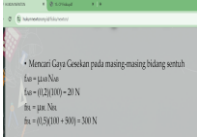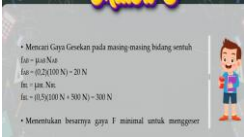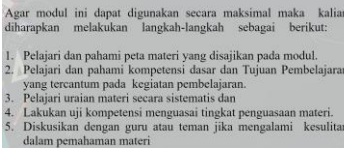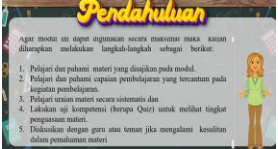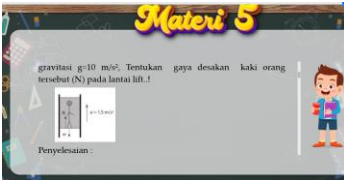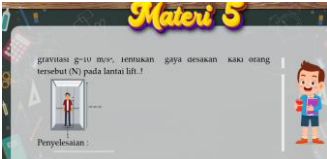
Table. 4 *Initial motivation and final motivation of n-gain results*

	N	Minimum	Maximum	Mean	Std. Deviation
N_Gain	33	0,42	1,00	0,7163	0,153552
Valid N	33				

Evaluation stage analysis

The evaluation stage aims to minimize errors at each stage of the ADDIE model. At this stage, data results from validators and product users are collected and used as considerations in improving the product based on predetermined aspects. The evaluation data presented is only a formative evaluation related to product efficiency and quality. At this stage, revisions are made based on suggestions/comments from validators regarding the *Articulate Storyline* Assisted Learning Media product developed where criticism and suggestions on comments from validators are the basis for revising/improving the product to improve the resulting product for the better, the following is a summary of suggestions/comments and inputs given by validators to Assisted *Learning Media The articulated storyline developed is* presented in Table 5.

Table. 5 *Media improvement evaluation*

No.	Revised section	Suggestion	Repair
1		For each value that has a unit, please include the unit	
2		Point 1: Material map is not yet available Point 2: Adjust to the independent curriculum Point 4: Competency test (in the form of a Quiz)	
3		Provide easy access buttons for shortcuts to the next slide	
4		Use 3rd Image 3D	
5		Don't use icons that mean restart but use icons that mean go to the beginning (Home)	

Discussion

Student response to articulate-assisted interactive median, storyline

Students' responses to the interactive learning materials assisted by Articulate Storyline 3 were considered to have excellent results. Overall, it does not provide input to revise the product but rather responds that the media is said to be an additional learning resource, very interesting, and easy to understand. The results of the response test, if combined and averaged, get results that can be interpreted as "Very Good" while in the book of Sugiyono (2017), it is said that the score range of 81 ≤P≤100% is included in the Very Good category.

Feasibility of interactive media products based on validation results

The interactive educational material in Articulate Storyline 3 is considered very good. Given the findings of the analysis, the evaluation of the three experts, taken as a whole, was scored in a highly valid category for the material, media, presentation, language, and motivation to be utilized in the teaching and learning process. Aligned with research by Putri and Hamimah (2023) that the developed media obtained a percentage of material validity of 90% which was interpreted as very valid, media validity of 88.75% with very valid interpretation, and language validity of 82.5% with interpretation validation.

This learning media is made with PBL syntax guided through instructions. Instruction is given to direct students to solve problems in groups through discussion activities. In the learning media, supporting videos of the material explained are also inserted so that students' understanding of the material will increase. Align with Riyanto et al. (2020) Which states that the existence of videos in interactive learning media will provide students with a contextual learning experience.

Aspects of using interactive media products

The aspect of using the product is that the media is easy to use, can be used on electronic devices at the same time, and does not require much space because it is accessed online. Research by Albana and Sujarwo (2021) indicate that interactive multimedia have several advantages, including; Flexibility in time and use because students can choose the content of each component of the material presented, self-temping means that students can set their learning speed, content-rich means interactive learning media provides quite a lot of information, and interactive means that learning media can provide opportunities for students to provide responses that will eventually be responded to by multimedia. The ability to help students understand concepts related to excretory system information is one aspect of learning content. This is because the material is presented in an easy-to-understand way.

Increasing student learning motivation

According to the results of the motivation questionnaire, students' motivation to study physics content, especially those related to Newton's laws, is classified as "Motivated" from the beginning before the media is presented. Research findings on students' willingness to study physics content, specifically Newton's law content, can be grouped into the category of "Highly Motivated" student motivation after media exposure. This is in line with the findings of the study by Mahardhaik and Wiyatmo (2021) who suggest that creating a learning atmosphere that is not only presented in the form of text and images but also equipped with visual animations to make it more interesting. So that there is an influence on students' interest in learning.

Advantages and disadvantages of interactive media

Although the Articulate Storyline-assisted learning media has many advantages, several weaknesses and limitations need to be considered. One of its main drawbacks is the complexity of the design, which requires high technical ability in designing learning modules. Users must master graphic

design, simple programming, and interactive learning principles to produce quality media. This can be challenging for educators who do not have a technological background or supporting resources. In addition, dependence on technology is also an obstacle, especially in areas with limited infrastructure, such as unstable internet connections or lack of supporting devices such as computers and tablets.

From the user's side, the large file size on the Articulate Storyline module can be a bottleneck, especially if the learner has a device with limited storage capacity. The resulting products are also sometimes not fully compatible with all types of devices, despite having responsive features. In the media that has been developed, there is still no time-use duration feature. This shows that, although Articulate Storyline is a powerful tool, its implementation still requires careful planning and adequate support.

Conclusion

The following conclusions can be drawn from the information provided by the research findings and discussions: (1) Articulate Storyline 3's interactive learning media assisted by Articulate Storyline 3 is rated high. According to the findings of the analysis, the combined evaluation of the three experts resulted in an overall score of 85.30%, indicating that this learning resource is very suitable for use in the teaching and learning process. (2) With a score of 86.56%, the evaluation of students' responses to the interactive learning materials assisted by Articulate Storyline 3 was categorized as very good. (3) Based on the results of the initial motivation questionnaire which has a percentage of 73.86%, students' motivation to learn physics material, especially Newton's law material, can be classified as "Motivated" from the beginning before the media is presented. The motivation of students to study physics material, especially Newton's law material in the results of the final motivation questionnaire, obtained a percentage of 93.29%, this can be categorized as student motivation after being given the media, namely "Highly Motivated" from the initial motivation to the final motivation obtained with an average N-Gain of 0.7163 or above the average of 0.7 in the high category.

Further research is suggested that to be able to research the development of Articulate Storyline-assisted media to improve student learning outcomes in physics materials, it is recommended that media development be equipped with a feature of the duration of time of use. This feature allows educators to monitor the duration of students' access to media so that the effectiveness of learning time can be better evaluated. Further research is also expected to add Student Worksheets (LKPD) to the media, to support interactivity and increase students' understanding of the material presented.

Acknowledgments

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Abdullah. (2016). *Educational Ethics*. PT Raja Grafindo Perkasa.

Sugiyono, 2017. Quantitative, qualitative, and R&D research methods. Bandung: Alfabeta

Adawiyah, R., & Dalimunthe, A. A. (2022). The implementation of tiktok application as a medium for developing students' english speaking skills. *Edukasi: Jurnal Pendidikan Dan Pengajaran*, *11*(1), 84–100.

Adiyatma, J., & Diyana, T. N. (2024). Pengembangan media pembelajaran fisika berbasis articulate storyline dengan topik gerak lurus. *Jupeis : Jurnal Pendidikan Dan Ilmu Sosial*, *3*(1), 67–74. Https://Doi.Org/10.57218/Jupeis.Vol3.Iss1.953

Albana, L. F. A. N. F., & Sujarwo. (2021). Pengembangan e-modul interaktif untuk meningkatkan kemandirian belajar dasar desain grafis. *Jurnal Kependidikan*, *5 (2)*, 223–236. Https://Journal.Uny.Ac.Id/Index.Php/Jk/

Astuti, R., Nisak, N. M., Nadlif, A., & Wulan Hajjatul Zamzania, A. (2021). Animated video as a media for learning science in elementary school. *Journal Of Physics: Conference Series*, *1779*(1). Https://Doi.Org/10.1088/1742-6596/1779/1/012051

Azizah, Z. L., Dayati, U., & Hady, N. (2020). The implementation of radec model assisted by crossword puzzle to improve students' critical and creative thinking. *Edukasi: Jurnal Pendidikan Dan Pengajaran*, *11*(September), 22–33.

Caesaria, C. A., Jannah, M., & Nasir, M. (2020). Pengembangan video pembelajaran animasi 3d berbasis software blender pada materi medan magnet. *Southeast Asian Journal Of Islamic Education*, *3*(1), 41–57. Https://Doi.Org/10.21093/Sajie.V3i1.2918

Dewi, L. K., Mustaji, & Fatirul, A. N. (2021). Pengembangan multimedia pembelajaran pada mata pelajaran pemrograman web untuk siswa sekolah menengah kejuruan. *Jurnal Inspirasi Pendidikan*, *11*(2), 72–80. Https://Doi.Org/10.21067/Jip.V11i2.5305

Emda, A. (2018). Kedudukan motivasi belajar siswa dalam pembelajaran. *Lantanida Journal*, *5*(2), 172. Https://Doi.Org/10.22373/Lj.V5i2.2838

Feri, A., & Zulherman, Z. (2021). Analisis kebutuhan pengembangan media pembelajaran ipa berbasis nearpod. *Jurnal Imiah Pendidikan Dan Pembelajaran*, *5*(3), 418. Https://Doi.Org/10.23887/Jipp.V5i3.33127

Hadinoto, R. T., Sunaryo, S., & Rustana, C. E. (2023). Kelayakan media pembelajaran interaktif yang dikembangkan dengan menggunakan powerpoint ispring suite 8 pada konsep fluida statis untuk peserta didik sma. *Xi*, 89–96. Https://Doi.Org/10.21009/03.1102.Pf13

Hafizah, S. (2020). Penggunaan dan pengembangan video dalam pembelajaran fisika. *Jurnal Pendidikan Fisika*, *8*(2), 225. Https://Doi.Org/10.24127/Jpf.V8i2.2656

Hidayat, F., & Nizar, M. (2021). Model Addie (analysis, design, development, implementation and evaluation) dalam pembelajaran pendidikan agama islam addie (analysis, design, development, implementation and evaluation) model in islamic education learning. *Jurnal Uin*, *1*(1), 28–37.

Kamilah, S. F., Wahyuni, I., & Ratnasari, D. (2023). Pengembangan media pembelajaran interaktif

berbasis website menggunakan google sites pada materi ekosistem kelas x sma. *Biodik*, *9*(3), 176–181. Https://Doi.Org/10.22437/Biodik.V9i3.25523

Kasrina, E. (2023). Metode reward dan punishment: Solusi tepat dalam meningkatkan motivasi belajar siswa. *Edudeena : Journal Of Islamic Religious Education*, *7*(1), 97–109. Https://Doi.Org/10.30762/Ed.V7i1.978

Mahardhika, L. J., & Wiyatmo, Y. (2021). Pengembangan media pembelajaran interaktif berbasis software articulate storyline 3 untuk meningkatkan minat dan hasil belajar fisika peserta didik sma n 1 kasihan kelas x. *Jurnal Pendidikan Fisika*, *8*(4), 1–8. Https://Journal.Student.Uny.Ac.Id/Index.Php/Pfisika/Article/View/17885

Muhammad, M. (2016). Pengaruh motivasi dalam pembelajaran siswa. *Lantanida Journal*, *4*(2), 87–97. Https://Doi.Org/10.56832/Edu.V2i2.198

Pratama Putra, B. (2022). Development of sscs-based e-modules (search, solve, create, share) to practice creative thinking skills of students on wave materials in high school. *Ijoem : Indonesian Journal Of E-Learning And Multimedia*, *1*(1), 19–25. Https://Doi.Org/10.58723/Ijoem.V1i1.3

Putri, N. M., & Hamimah, H. (2023). Pengembangan multimedia interaktif wordwall menggunakan model problem based learning (pbl) pada pembelajaran ipa. *Journal Of Practice Learning And Educational Development*, *3*(1), 95–99. Https://Doi.Org/10.58737/Jpled.V3i1.99

Rahmawati, Y., Febriyana, M. M., Bhakti, Y. B., Astuti, I. A. D., & Suendarti, M. (2022). Pengembangan media pembelajaran fisika berbasis game edukasi: Analisis bibliometrik menggunakan software vosviewer (2017-2022). *Jurnal Penelitian Pembelajaran Fisika*, *13*(2), 257–266. Https://Doi.Org/10.26877/Jp2f.V13i2.13170

Riyanto, Amin, M., Suwono, H., & Lestari, U. (2020). The new face of digital books in genetic learning: A preliminary development study for students' critical thinking. *International Journal Of Emerging Technologies In Learning*, *15*(10), 175–190. Https://Doi.Org/10.3991/Ijet.V15i10.14321

Rosniadi Pratama, O., Connie, C., & Risdianto, E. (2022). Development of a learning module using the selforganized learning environment (sole) model with augmented reality assistance on the materials of rotation dynamics and equality of rigid bodies. *Ijoem : Indonesian Journal Of E-Learning And Multimedia*, *1*(1), 1–11. Https://Doi.Org/10.58723/Ijoem.V1i1.2

Sabrina, I. H., & Russanti, I. (2022). Pengembangan media pembelajaran shibori berbasis video tutorial melalui youtube. *Jurnal Mahasiswa Unesa*, *11*, 14–19.

Wahab, A., Junaedi, J., & Azhar, M. (2021). Efektivitas pembelajaran statistika pendidikan menggunakan uji peningkatan n-gain di pgmi. *Jurnal Basicedu*, *5*(2), 1039–1045. Https://Doi.Org/10.31004/Basicedu.V5i2.845

Wulandari, A. P., Salsabila, A. A., Cahyani, K., Nurazizah, T. S., & Ulfiah, Z. (2023). Pentingnya media pembelajaran dalam proses belajar mengajar. *Journal On Education*, *5*(2), 3928–3936. Https://Doi.Org/10.31004/Joe.V5i2.1074