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THE EFFECT OF ARTICULATE STORYLINE 3-BASED PHYSICS MEDIA ON STUDENTS' INTEREST AND LEARNING OUTCOMES

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Abstract. One of the main factors in low learning outcomes for students occurs due to students' lack of interest in learning. This allows teachers to compete in creating interactive learning media so that students' interest in learning can be increased. So, the aims of this research are 1) to describe the effect of physics learning media based on Articulate Storyline 3 on high school students' interest in learning about Forces and Newton's Laws, and 2) to describe the effect of physics learning media based on Articulate Storyline 3 on the learning outcomes of high school students on Forces and Newton's Laws. The type and design of this research are true, with a quantitative approach and posttest-only control design. The results obtained in this research with the help of the SPSS 25 program, for student interest data using the Independent Sample T-Test, obtained a Sig value. (2-tailed) 0.001. Meanwhile, the student learning outcomes data obtained using the Mann-Whitney U-test obtained a Sig value. (2-tailed) 0.011. So the conclusion drawn based on the results obtained is that Articulate Storyline 3-based media has a good influence on students' interest in learning and their learning outcomes for high school students on Force and Newton's Laws.

Keywords: articulate storyline, learning media, student learning interest, student learning results

INTRODUCTION

The rapid development of technology in the 21st century has enabled conventional learning to become modern learning that utilizes technology in the learning process (F. Sari & Atmojo, 2021). The use of technology in learning, especially in physics learning, can make it easier for teachers to provide material so that it can be easily understood by students and can have a positive impact on students' interest or motivation in learning (Haidir et al., 2021). In addition, teachers as student facilitators must be able to follow technological advances by creating learning media to avoid failure in the learning (Asmaningrum, 2017).

Learning media is a real form of technology utilization in learning activities. One important factor in improving the quality of student learning outcomes is the selection of the right media in the learning (Anitasari & Utami, 2022). Therefore, the selected learning media is expected to be able to convey learning concepts that are consistent, clear, and interesting and can improve the learning outcomes of students who have not met the minimum learning mastery standard and can be accessed anytime and anywhere (Maharani et al., 2024). According to Yakin (2021) students' interest in learning can be increased by using learning media to improve their learning outcomes. This statement is also supported by Mardatillah et al., (2023), the use of appropriate learning media can stimulate students' interest in learning, which can improve the quality of their learning outcomes.

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Physics is a science that studies natural phenomena and symptoms in inanimate objects (Siahaan & Sitinjak, 2021). One of the physics materials that is considered difficult is the material on force and Newton's laws. This material is a basic concept of dynamic physics that must be mastered by each student, where this material is related to force and motion, such as in the material on work and energy (Ayumniyya & Setyarsih, 2021). Azzahidah et al., (2024) stated that students' difficulties with Newton's Law material were due to students' low conceptual understanding of the concept of force and motion when applied in everyday applications.

Based on the results of interviews and observations conducted at one of the senior high schools in Probolinggo City, in class learning, some students do not pay attention to the teacher's explanation and are busy with their own activities. Moreover, in schools, the learning resources used are still in the form of printed books, with the help of learning media used in the form of YouTube and whiteboards. Therefore, interactive learning media is needed to attract students' interest and attention in learning and improve the quality of their learning outcomes in physics subjects. In line with Putri et al., (2019), the lack of utilization of learning media causes students to be less interested in learning in class, which is indicated by students' indifference when the teacher explains the material.

One of the interactive learning media that can be accessed anytime and anywhere is web-based learning media. Articulate Storyline 3. This media is an interactive learning media whose final result is a web (HTML5) or can be converted into an Android application. This media is almost similar to Microsoft PowerPoint but has its own advantages where the media is based on Articulate Storyline 3, used during learning and contains several features that can be combined, including images, graphics, animations, sound, text, videos, and practice questions (Yulistya et al., 2022). According to R. Sari & Harjono (2021), teachers can be helped by the presence of Articulate Storyline media, and the material presented can be easily understood by students and provides enthusiasm for learning.

One of the internal factors of learning interest to improve the quality of education is student learning outcomes. Learning interest has an important influence on the teaching and learning process carried out by teachers; high learning interest supports maximum learning outcomes (Prastika, 2020). Learning interest indicators according to Yulistiarawati et al., (2021) namely four indicators including student involvement, student interest, student involvement, feelings of pleasure, and student attention.

The achievement of student learning outcomes is the key to achieving educational goals by improving the quality of education, which can be proven by the values and evaluation results that have been carried out by teachers through practice questions and exams that have been passed (Yandi et al., 2023). Three aspects of student learning outcomes include affective, psychomotor, and cognitive aspects (Mahmudi et al., 2022). The learning outcome indicators used in this study belong to Anderson & Krathwol (2015) in the cognitive aspects C3 – C5, namely applying (C3), analyzing (C4), and evaluating (C5).

According to Bahrianti et al., (2024) one of the factors causing low interest in learning is the lack of variety in learning media used by teachers. The use of interactive learning media such as learning media Articulate Storyline 3 needs to be implemented in various schools to increase students' interest in learning. The use of learning media as a means for teachers to convey messages to students is a major factor today (Maharani et al., 2024). According to research by Dani & Arief, (2021), learning using learning media based on Articulate Storyline has a positive effect on improving students' physics learning outcomes. According to (Rukmana & Salirawati,

2024), learning with media Articulate Storyline has a good influence in increasing students' interest in learning. Therefore, the use of technology, one of which is Articulate Storyline 3, can arouse students' interest in learning, where this media is an interactive media containing many features that can be created by yourself. In addition, this media can also contribute to supporting interest and learning outcomes for physics materials.

METHOD

Quantitative research with the research type *True Experimental.* Experimental research, according to Setyaningsih et al., (2020) contains the aim of testing the relationship between two variables, namely the independent variable and the dependent variable. Research design with posttest-only control design shown in Table 1.

Table 1. Research design

Class	Treatment	Posttest
Control	-	O_1
Experiment	X	O_2

Sugiyono (2020)

This study took place at SMA Negeri 4 Kota Probolinggo in the odd semester of the 2024/2025 academic year, with grade XI students who received physics subjects as the population to be used, and a homogeneity test was carried out before determining the research sample. The homogeneity test was carried out using the previous physics exam scores. The population results showed that the data was homogeneous, so the research sample was determined by cluster random sampling, with the samples used divided into two, namely the experimental class and the control class. Where the control class is a class that is given the usual treatment given by the teacher. While the experimental class is a class that is given media based on Articulate Storyline 3 during learning activities.

In the student learning interest questionnaire, scoring in the form of points is used to measure student interest in learning about physics-based learning media. Articulate Storyline 3. The scoring criteria for the questionnaire obtained are shown in Table 2.

Table 2. Questionnaire scoring criteria

Score	Information
4	Strongly Agree (SS)
3	Agree (S)
2	Disagree (TS)
1	Strongly Disagree (STS)

Then, the questionnaire results obtained are calculated using the following equation to convert the scores into values.

$$\text{Value} = \frac{Score\ obtained}{Maximum\ score} \times 100$$

Homogeneity Test

This test is used to ensure that the data is homogeneous or not in the samples being tested. The use of this test is carried out before determining the sample in the control class or the experimental class. The data tested is based on the repeat value in the previous material.

a. When the significance value is ≥ 0.05, the data is homogeneous.
b. When the significance value is < 0.05, the data is not homogeneous.

Normality Test

This test is intended to determine whether the data obtained is normal or not. The calculation is carried out on the SPSS 25 program with Kolmogorov-Smirnov.

a. When the Sig. value is ≥ 0.05, the data is normally distributed.
b. When the Sig. value is < 0.05, the data is not normally distributed.

Hypothesis Test

In analyzing the data obtained in the form of tests, the t-test with the independent sample t-test type is used if the results of the normality test prove normal, and the data is not normal with the Mann-Whitney U-test. The following is the hypothesis formulation in the hypothesis test conducted:

a. H_0 : There is no difference in the application of physics-based learning media Articulate Storyline 3 in both sample groups.
b. H_a : There are differences in the application of physics-based learning media Articulate Storyline 3 in both sample groups.

With the following criteria for drawing conclusions for hypothesis testing:

a. When the significance is ≤ 0.05, then H_0 is rejected and Ha is accepted.
b. When the significance is > 0.05, then H_0 is accepted and Ha is rejected.

RESULTS AND DISCUSSION

The Influence of Physics-Based Learning Media Articulate Storyline 3 on High School Students' Learning Interests in Newton's Force and Law Material

The purpose of administering the questionnaire to both groups of tested samples was to examine the influence of students' interest in learning. The statements in the questionnaire were designed by referring to four indicators of students' interest in learning according to Yulistiarawati.*et al*., (2021). Each indicator contains five statements, so the total number of statements in the questionnaire are 20 statements. The results of the learning interest questionnaire are in the form of scores obtained by each student, which are later converted into values calculated with the help of *Microsoft Excel* with the equation above. Data on student learning interest values in both samples for each indicator are in Table 3.

Table 3. Student learning interest data

Class	Lowest Value	The highest score	Rate-rate	Standard Deviation
Control Class	25	95	54.73	12.485
Experimental Class	38	95	64.27	16.858

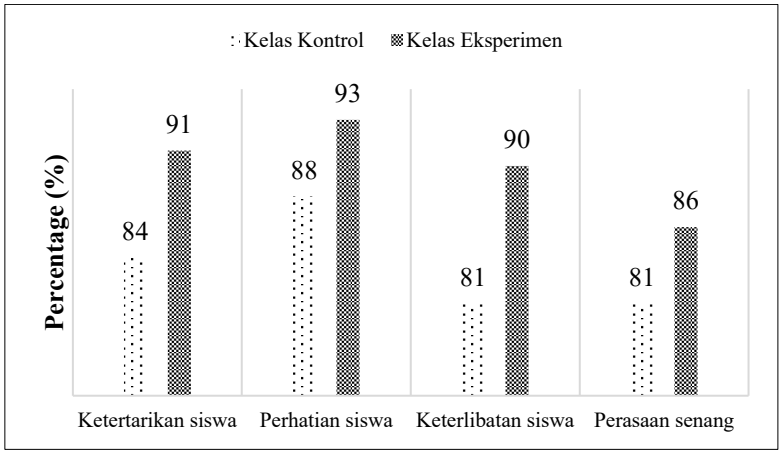

Figure 1. Percentage of student learning interest for each indicator

The questionnaire used refers to four indicators of student learning interest, with each indicator consisting of five statements. Based on Table 3 above, a difference was found in the average value of students' interest in learning in the two sample groups, where the higher/superior value was obtained by the experimental class above the control class.

Table 4. Normality test of students' learning interests

	Interest in Learning Experimental Class	**Learning Interests of Control Class**
Sig. value	0.200	0.200
Conclusion	Normal	Normal

Based on Table 4 above, it was found that students' learning interest obtained the lowest value for the control class of 57.50 and the highest value of 96.25 and an average value of 81.86. While for the experimental class, the lowest value was 71.25 and the highest value was 100, with an average value of 90. The percentage of students' learning interest for each indicator is seen in Figure 1 above. In the control class, the first indicator, namely student interest, obtained a percentage of 84%; the second indicator of student attention was 88%; the third indicator of student involvement was 81%; and the fourth indicator of feelings of happiness was 81%. While for the experimental class with the first indicator of student interest with a percentage of 91%, the second indicator of student attention was 93%, the third indicator of student involvement was 90%, and finally feelings of happiness were 86%.

As shown in Table 4, in both sample groups, it is 0.200. Therefore, according to the existing conclusion-making provisions, if the value is > 0.05, the data is normal, so the results of the normality test of learning interest obtained by students in both sample groups show that the data is normal. So for the hypothesis test, we can use the independent sample t-test.

Table 5. Test *independent sample t-test* student learning interest

	Sig (2-tailed)	**Information**
Control Class Experimental Class	0.001	H_0 rejected and H_a accepted

Based on value Sig (2-tailed) in Table 5, it was found that the hypothesis test obtained 0.001 < 0.05; then H0 was rejected and Ha was accepted. The results obtained can be said to show that there are differences in the application of the learning media towards students' interests during learning. Through these differences, it can be concluded that physics learning media based on Articulate Storyline 3 has a good influence on students' interest in studying at State Senior High School 4, Probolinggo City.

Based on research data obtained through Microsoft Excel, in each indicator of learning interest, the experimental class has an average value above the control class. This is in line with the objectives of this study. Then, the results of the normality test produced in the test One-Sample Kolmogorov-Smirnov In SPSS 25, normal data was obtained for both sample groups. Therefore, the difference test was carried out with the T-Test, and the results obtained were that students' interest in learning, especially in class XI at State Senior High School 4, Probolinggo City, could be influenced by the application of physics-based learning media. Articulate Storyline 3 on the material of Force and Newton's Laws.

The results obtained due to interactive media can be related to student interest during learning. The more varied and interactive the learning media used, the more enthusiastic students tend to be when learning activities take place. In line with research by Amalia et al., (2024) that the use of interactive media can motivate students, and they tend to be more interested during the science learning process. This was shown when the research took place, where students in the experimental class tended to ask more questions and were enthusiastic when understanding the material and discussing the tasks given. It can be seen from the students' facial expressions that they are more comfortable and happy, and the class conditions feel more conducive and exciting. This interest is also caused by learning media based on Articulate Storyline 3. This is equipped with interesting features. Learning using interactive media is included in the constructivism theory. Cognitive theory of multimedia learning by Richard Mayer that combines text, images, audio, and video in one learning medium. This can increase student motivation and understanding and increase student enthusiasm in learning (Siregar et al., 2024). The interactive media used is also equipped with a video of the application of Newton's Force and Law, where students can see real examples of applications in students' daily lives, and a cute and colorful media display. In addition, this learning media is also equipped with background sound settings so that students can choose which background sound to use on the media along with its volume settings. Providing this background can also provide a more comfortable learning atmosphere for students because with this the learning media can feel like an application game but contains learning materials.

This is also supported by the existence of learning evaluations that allow students in the experimental class to play an active role in involvement in completing e-worksheets in the media. Articulate Storyline 3 (Student involvement). E-worksheets on the media is in the form of questions by utilizing existing features, in the form of multiple choice, more than one choice, matching, and short answers to foster student interest (student interest). In the control class, in the form of student worksheets with the form of questions the same, but still write it down on the sheet itself. This allows learning in the experimental class to seem more active and enthusiastic and can attract students' interest during learning without having to burden students.

Research by applying learning interest indicators according to Yulistiarawati et al., (2021). All indicators of student learning interest obtained are categorized as

very good. In the indicator of student interest and involvement, this is due to the presence of evaluation questions in the media. Articulate Storyline, which looks more interesting. In line with Adisti et al., (2023) giving interactive quizzes on media Articulate Storyline, which can be done directly by students, can foster students' interest in learning. In addition, based on the results of an interview with one of the students, it was stated that the use of Articulate Storyline 3, which is used in the experimental class, allows students to be happier in following physics learning due to the features that can attract students' attention in learning. Strengthened by Khaerat et al., (2023) learning with Articulate Storyline 3 makes learning fun. In addition, increased interest and motivation of students in learning will arise, and students can more easily understand the material due to the use of this media.

In line with Bahrianti et al., (2024) research, earning in experimental classes that implement media based on Articulate Storyline have a higher interest in learning than the control class. Strengthened by Winaldi et al., (2023) there was an increase in the percentage of student learning interest, with an initial percentage of 60% then increasing to 97.14% of 32 students in the experimental class. So, through these results, there was a significant increase for the media Articulate Storyline on students' learning interest. According to several studies that are in line with this media, it can be concluded that there is a good influence on students' interest in learning by implementing media based on Articulate Storyline.

The Influence of Physics-Based Learning Media Articulate Storyline 3 on High School Students' Learning Outcomes on Newton's Force and Law Material

The learning outcomes obtained by students are taken from the posttest distributed to each student. The provision of a posttest, namely, to examine the influence of learning outcomes obtained by students by providing differences in the application of learning media for the two sample groups. The data is shown in Table 6 below:

Table 6. Student learning outcome data

Class	Lowest Value	The highest score	Rate - rate	Standard Deviation
Control Class	25	95	54.73	12.485
Experimental Class	38	95	64.27	16.858

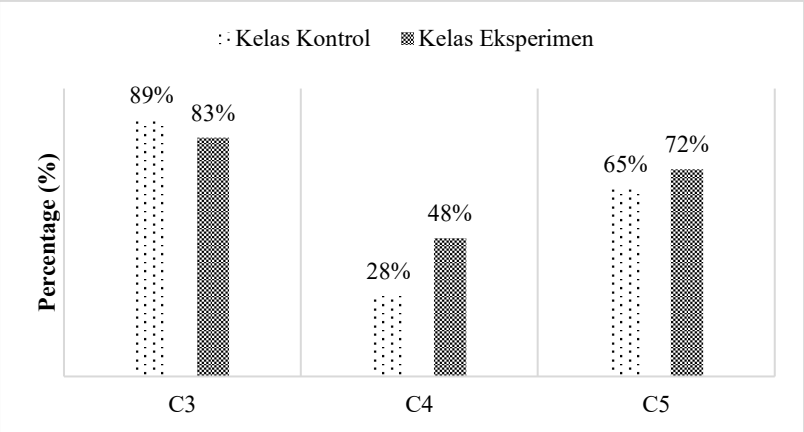

Figure 2. Percentage of student learning outcomes for each indicator

The data in Table 6 is generated from posttests with as many as 26 in each class. In the control class the lowest score obtained was 25 and the highest score was 95, so the average score was 54.73. While the lowest score in the experimental class was 38 and the highest score was 95, and they obtained an average of 64.27. The percentage of student learning outcomes for each indicator can be seen in Figure 2. In the control class, indicator C3 obtained a percentage of 89% from 2 questions, indicator C4 28% from 1 question, and indicator C5 65% from 2 questions. While for the experimental class, indicator C3 obtained a percentage of 83%, indicator C4 48%, and indicator C5 72%.

From the data that has been obtained, it can be seen that the learning outcomes of the control class are lower than the results of the experimental class. Furthermore, a normality test is carried out first as proof of normal data or not with the test One-Sample Kolmogorov-Smirnov test. The results of the normality test of student learning outcomes are shown in Table 7.

Table 7. Normality test of student learning outcomes

	Interest in Learning Experimental Class	Learning Interests of Control Class
Sig. value.	0.011	0.200
Conclusion	Normal	Normal

Shown in Table 7, in both sample groups, is 0.011. So, according to the existing conclusion-making provisions, the data is said to be abnormal if the value is less than 0.05, so that the learning outcome data in both sample groups after the normality test states that the data is not normal. Then, to answer the hypothesis, it is carried out test Mann Whitney U-Test:

Table 8. Test Mann-Whitney U-test student learning outcomes

	Sig (2-tailed)	Information
Control Class Experimental Class	0.018	H_0 rejected and H_a accepted

The hypothesis test obtained a value of $0.018 < 0.05$; then H_0 was rejected and H_a was accepted. The results obtained can be said to show that there are differences in the application of the media in the results obtained by students during the learning process. The existence of these differences can draw the conclusion that physics learning media based on Articulate Storyline 3 influences the results obtained by students at State Senior High School 4, Probolinggo City, when studying.

According to the results of the study on both sample groups whose data had been processed with the help of the SPSS 25 program, it was found that in the experimental class the learning outcome values had an average result that was superior to the control class. The normality test produced in both sample groups in the One-Sample Kolmogorov-Smirnov test In SPSS 25, the data is stated to be distributed abnormally so that in determining the difference between the two sample groups using the Mann-Whitney U-Test on the nonparametric test. However, the test results produced stated that there was a positive influence on the learning outcomes obtained by class XI students of SMA Negeri 4 Kota Probolinggo on the subject of Newton's Force and Law with physics learning media based on Articulate Storyline 3.

The increase in learning outcomes obtained by the experimental class was influenced by the application of physics-based learning media. Articulate Storyline 3

because the media that the author designed for learning is equipped with very complete features. The media is equipped with brief material so that the material listed can be more easily understood by students. This brief material can make it easier for students to get the core of the learning that is taught so that students can be interested in reading or studying the material. In addition, in this media there are sample questions and e-worksheets that students can work on directly so that it can make it easier for students to answer them. The presence of e-worksheets in this media It also creates a more enthusiastic learning atmosphere and can attract students' attention so that in working on existing problems, students do not feel burdened and can influence the results obtained by students when studying, which is proven by superior results. posttest in the experimental class. Where the posttest contains HOTS questions with indicators C3, C4, and C5, but with the use of this media as an evaluation of practice questions before the posttest is done, students can easily do it. In accordance with the theory of constructivism (Cognitive Theory of Multimedia Learning) by Richard Mayer, the use of interactive media containing practice questions and materials with audio visuals can encourage student motivation, which encourages students to be more active in learning so that they can improve their learning outcomes. In line with research (Rahady et al., 2023) the use of HOTS-based e- worksheets with indicators C3, C4, and C5 can make it easier for students to understand and solve science problems. Supported by Choiroh et al., (2022), the use of e- worksheets in interactive media can motivate students and influence their learning outcomes, especially on HOTS questions.

Research by applying learning outcome indicators according to Anderson & Krathwol's revised Bloom Taxonomy (2015) for the low cognitive levels C3 - C5. In the cognitive domain, C3 (Applying) obtained a percentage of 83%, which is included in the good category. Based on the results of an interview with one of the students, the questions in the cognitive domain C3 are classified as questions that can still be understood by students. Strengthened by Sunarsih et al., (2022) most students understand the cognitive domain C3, with some students who do not understand because students do not pay attention to the material during the learning process. The cognitive domain C4 (Analyzing) gets a percentage of 48%, which is still in the very poor category. This is due to the lack of understanding of students in solving problems, such as student errors in understanding concepts (Nabilah et al., 2020). At level C5 (Evaluating), getting a percentage of 72% is classified as good. The ability arises due to students' understanding in the cognitive domains C3 and C4 (Dahlan et al., 2021).

According to the findings of Purba et al., (2023), the learning outcomes achieved by students increased after implementing similar learning media. Supported by Maharani et al., (2024), a positive impact occurred on the learning outcomes demonstrated by students by providing media based on Articulate Storyline. The hypothesis test conducted obtained better learning results with the media. Finally, it is also supported by Jais & Amri, (2021), there is a good impact on the learning outcomes achieved by students due to the use of interactive media based on Articulate Storyline 3. In the study, almost all students had learning outcomes in the complete category; only one student was in the incomplete category out of 16 students.

This learning media is an interactive learning media that also has several weaknesses. The weaknesses of the learning media that have been designed include learning by implementing this learning media, which emphasizes learning that is more focused on students, where the presence of teachers is not effective in learning because the media has loaded all the learning. In addition, the creation of this learning

media is quite difficult, and in its creation it also takes quite a long time to link several features, so this learning media is less effective if used as a daily learning media in schools. In relation to this, the possible implications are learning media based on Articulate Storyline 3. This can be used as a supporting learning medium outside of school or can be used as a reference or encouragement for teachers to make the learning process at school more creative and innovative in order to increase students' interest in learning and their learning outcomes.

Some of the obstacles encountered in this research are that some students do not have internet quotas or have poor internet connections. The solution to overcome this is to provide a hotspot for students who do not have an internet connection. The second obstacle is that some students do not come in or are exempted when learning activities take place. The solution provided is that students are asked to study the material themselves at home because the learning media is based on Articulate Storyline 3 and can be accessed anytime and anywhere.

CONCLUSION

The conclusion obtained from this research is that media based on Articulate Storyline 3 for the experimental class has a good influence on students' interest in learning along with their learning outcomes in class XI for the material of Newton's Force and Law at State Senior High School 4, Probolinggo City. This is shown by the higher questionnaire scores and posttest obtained by the experimental class. This is due to the fact that the media Articulate Storyline 3 has never been applied during learning at the school.

This learning media makes the learning atmosphere more interesting and enjoyable due to the learning media that looks like games but contains learning materials. The features and materials in this media can also be adjusted to the materials that will be used during learning. Therefore, this media can be applied to all subjects.

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