

Development of Interactive Learning Media Based on Articulate Storyline 3 on Newton's Law Material with a Contextual Approach at the Junior High School Level

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Received: December 21st, 2021

Accepted: January 10th, 2022

Online Published: January 31th, 2022

Abstract

Newton's Law material in science subjects at the junior high school level contains various examples of phenomena and actual applications in everyday life so learning on this material requires a contextual approach and better media in terms of visuals and interactivity. According to several sources, Articulate Storyline 3 is the recommended platform for producing interactive learning media during the COVID-19 pandemic, mainly attractiveness and practicality. This research aims: 1) to describe the validity of interactive learning media based on Articulate Storyline 3 on Newton's law material with a contextual approach at the junior high school level. 2) to describe students' responses to interactive learning media based on Articulate Storyline 3 on Newton's law material with a contextual approach at the junior high school level. This research and development carry on ADDIE stages (Analyze, Design, Develop, Implement, and Evaluate) with subjects including material expert, media expert, user teacher, and 32 students of SMPN 2 Balung, Jember, East Java. The product created is in APK (android package) format with a size of 42.62 MB. This product has a material feasibility level of 4.57 with the "very feasible" category. The media feasibility of 4.80 is included in the "very feasible" category. User eligibility is 4.78 in the "very feasible" category. This media received a positive response from students with a score of 4.00 in the "feasible" category. Overall, the learning media can be determined to be "very valid" for use as a learning medium.

Keywords: Articulate Storyline 3, interactive learning media, contextual approach, COVID-19

How to cite this article :

Husna, A., & Fajar, D. M. (2022). Development of Interactive Learning Media Based on Articulate Storyline 3 on Newton's Law Material with a Contextual Approach at the Junior High School Level. *IJIS Edu : Indonesian Journal of Integrated Science Education*, 4(1), 17-26 . doi:<http://dx.doi.org/10.29300/ijisedu.v4i1.5857>

INTRODUCTION

Today's world of education cannot be separated from the implementation of online learning during the COVID-19 pandemic. Online learning is a method of ensuring that teaching and learning activities are carried out at all times. The use of internet-based technical functions that rely heavily on information technology (IT) is the hallmark of online learning. The ability of teachers to handle technology, particularly IT-based learning material, is critical to the success of online learning (Asmuni, 2020).

Learning media are tools or intermediaries that let people systematically communicate messages and create a helpful learning environment for the recipient to carry out the learning process successfully (Darnawati et al., 2019). Using learning media serves a variety of purposes, including facilitating the delivery of material, increasing the efficiency of the learning process, and assisting students in maintaining their concentration while learning (Astuti et al., 2017). For science courses, particularly concepts with a lot of visual appeals and real-world applicability, learning media is beneficial in making the teacher's delivery of material more comprehensible (Narut & Ntelok, 2020).

During the pandemic, the usage of IT-based learning media must be optimized. Interviews with science teachers at SMPN 2 Balung, Jember, East Java, yielded the following findings. Teachers have never created interactive learning media on their own. The teacher records his voice and sends his instructions to the Whatsapp group during online learning. In the WA group, the teacher also shared the addresses of learning youtube videos that students must watch. Based on these findings, interactive learning media, such as android-based applications, are currently not available during the learning process.

Furthermore, preliminary research of 256 SMPN 2 Balung grade VII students indicated that, even though 95.5% of pupils said they enjoyed science sessions, 65.9% of pupils, on the other hand, acknowledged having difficulty in science classes, especially when it comes to physics formulas. According to learning styles, 95.5% of students said that if they read well, it was easier for them to catch lessons; 97.7% of students said it was simple to understand the subject matter if they had a good understanding

of the material; The subject matter given through demonstrations was easier to understand for 84.1% of students; 93.2% of students stated that pictures and animations were very helpful in remembering and understanding the lesson. These data conclude that students have varied learning styles. Therefore, selecting science learning media that can accommodate these needs to be prepared.

The learning media adopted in this paper is based on Articulate Storyline 3. Articulate Storyline 3 is a platform/software for creating interactive presentations similar to those created with Microsoft PowerPoint, but with more advanced capabilities that are simple to use, such as timeline, movie, picture, character, animation, and others. This platform's output can be in the form of websites (html5), videos, learning management systems (LMS), programs (exe), and other online and offline applications. This tool also includes several templates from which to construct interactive media, particularly for creating practice and test questions. In addition, Articulate Storyline 3 has a characteristic that there are menus such as the zoom button to enlarge the image, a question button for a more detailed explanation of the material, as well as navigation controls such as next, back, and submit that are always at the bottom of the screen and are immediately available in the media (Darnawati et al., 2019). Several studies have commented on the success of Articulate Storyline 3 as a platform for learning media during the pandemic (Jubaerudin et al., 2021; Mandasari et al., 2021; Midroro et al., 2021; Sadikin & Hardianti, 2021; Safira et al., 2021).

At the junior high school level, the topic that will be integrated into the learning media based on Articulate Storyline 3 is Newton's Law. Newton's Law material was chosen since it is essential for students to understand where the concepts create the foundation for studying future materials, such as work, energy, simple machines, pressure, electricity, magnetism, and so on. Furthermore, there are many applications and instances of occurrences in everyday life in Newton's law content, allowing students to feel more connected to the material (Ayumniyya & Setyarsih, 2021). According to the nature of the topic, the relevant approach to presenting Newton's Law material in Articulate Storyline 3-based learning media is the contextual teaching and learning (CTL) approach. The contextual approach emphasizes the relationship between

the material being studied and conditions in real life that students can see and analyse.

As expressed by Wahyuni, Rizki, Budiarso, Putra, & Narulita (2021), science topics, in general, have complex properties that necessitate critical thinking skills when assessing a problem in context. If students can relate the science subject they are learning with their daily lives; it will be a more meaningful learning experience (Amalina, 2020; Amallilah & Susanti, 2021). The quality of learning is also measured by how strong students gain meaningful experiences in learning (Rukajat, 2019; Syarifudin, 2020; Tanu, 2016). Teachers can encourage students to learn new things by relating what they currently know to real-life circumstances using a contextual approach so that children can learn from real-life objects in their surroundings (Afni & Hartono, 2020).

Studies on learning Newton's laws with a contextual approach have been reported by various researchers (Fathurohman, 2017; Fatmala et al., 2017; Mawaddah, 2018; Neftyan et al., 2018; Nurafifah et al., 2014; Putro et al., 2017), but similar research by integrating Articulate Storyline platform has not been found. Based on the description above, this paper will describe the results of research in the form of developing interactive learning media based on Articulate Storyline 3 on Newton's Law material with a contextual approach. The research objectives described include how (a) the results of material expert, media expert, and user validations, as well as (b) students' responses to interactive learning media based on Articulate Storyline 3 on Newton's Law material with a contextual approach that was developed.

METHOD

The type of research. This study is a research and development project based on Robert Maribe Brach's paradigm, namely ADDIE, which includes Analyze, Design, Develop, Implement, and Evaluate (Branch, 2009). Figure 1 depicts the development process.

Development procedures. The researcher does a requirements analysis relating to working

conditions and a situational analysis during the analyze stage so that items that need to be developed can be found. At the design stage, the researcher makes a design according to the needs that starts in the form of a plot summary or storyboard to make it easier to manufacture the product. Development stage, the researcher designs and builds the product, such as supporting items, uploads product outcomes in HTML5 format, and develops APK (*Application Package*). At the implement stage, researchers conducted product testing activities by validating experts, users (teachers), and students. At the evaluate stage, the researcher reviews each stage and improves the learning media.

Research subject. The research subjects in this study consisted of expert validators and students. Expert validation is carried out by 1 material expert and 1 media expert, both of whom come from competent lecturers in the relevant field. User validation is carried out by 1 science teacher. Audience validation was carried out by students grade VIII SMPN 2 Balung. After the validation results were obtained, the media was tested first in small groups of 10 students. A field test with 32 students was done after a small group trial. In this study, 32 grade VIII students from SMPN 2 Balung in the Jember area of East Java participated in a field trial (big group).

Assessment Instrument. The instrument used to test the validity of the resulting product is by using an instrument that includes: 1). Material expert validation sheet, 2). Media expert validation sheet, 3). User validation sheet, 4). Questionnaire for students' responses. Expert validation questionnaires and student response questionnaires were utilized to collect data in this study. The questionnaire used is a *checklist* with a Likert scale. Table 1, Table 2, Table 3, and Table 4 illustrate the questionnaire grid.

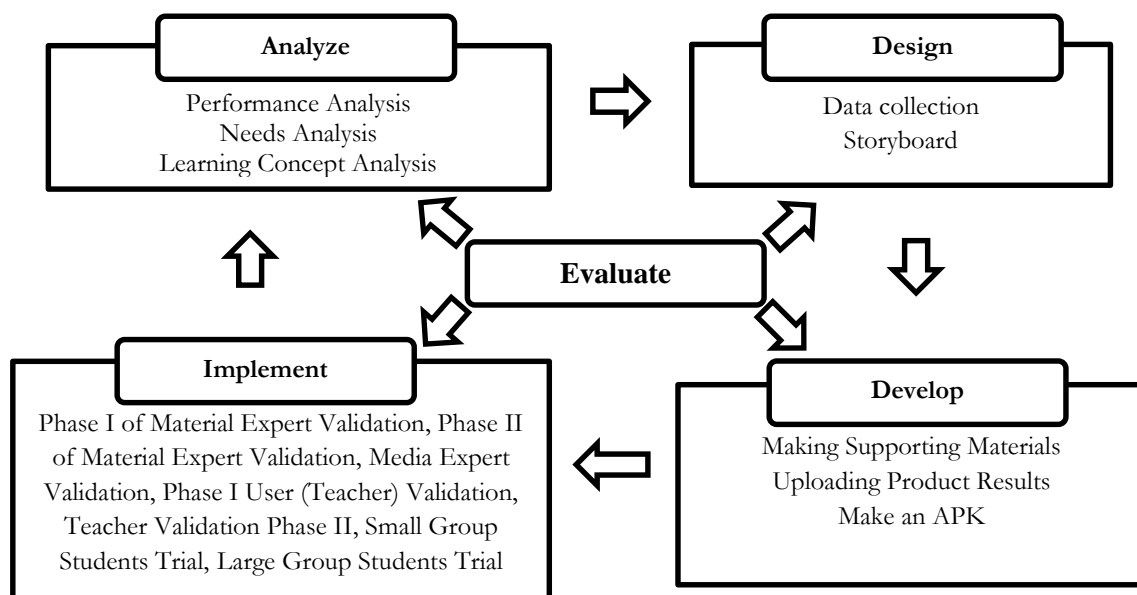


Figure 1: The Schematic of Product Development With ADDIE Stages

Table 1. Grids of Media Validity Assessment Questionnaires for Material Experts

No	Aspect	Indicator	Number of Items
1.	The aspect of material suitability	Suitability of the given material	4
		Material scope completeness	7
2.	The aspect of language suitability	Communicative nature of the language used	1

Table 2. Grids of Media Validity Assessment Questionnaires for Media Experts

No.	Aspect	Indicator	Number of Items
1.	Display Design Aspects	Suitability of the design	5
		Customization of menu and button layout	4
		Font size, color, and type	2
2.	Audio Aspect	Clarity of sound	2
		Accuracy of audio and backsound	1
3.	Video aspect	The video's compatibility with the content	1
		Video quality	1
4.	Animation Aspect	Animation and material compatibility	3

5.	Ease of Use of Media	Practicality	7
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Table 3. Grids of Media Validity Assessment Questionnaires for Users

No.	Aspect	Indicator	Number of Items
1.	Theory	The media's compatibility with the learning objectives	11
2.	Language	The suitability of the language used	3
3.	Media	The convenience of the media	5

Table 4. Student Assessment Grid

No.	Aspect	Indicator	Number of Items
1.	Theory	The media's compatibility with the learning objectives	5
2.	Language	The suitability of the language used	1
3.	Media	The convenience of the media	7

Technique for Analyzing Data. The data analysis technique used is descriptive statistics. Descriptive statistics are used to examine data by summarizing or characterizing the data as it

is, without making generalizations or conclusions that apply to the broader population (Sugiyono, 2012). The analysis was carried out quantitatively and qualitatively. Quantitative analysis is used to obtain a score of assessment results, where the average score category refers to Sukardjo in Listiyani and Widayati (2012). In comparison, qualitative analysis is used to obtain the results of comments, suggestions, and criticisms from the validators for media improvement.

Table 5. Actual Score Conversion Guidelines

Range	Criteria
4,21-5,00	Very Feasible
3,41-4,20	Feasible
2,61-3,40	Less Feasible
1,81-2,60	Not Feasible
0-1,80	Extremely not feasible

RESULTS AND DISCUSSION

The following are the outcomes of developing interactive learning media using Articulate Storyline 3 on Newton's law material with a contextual approach at the junior high school level:

Analyze

At this stage, it is related to working conditions and situational analysis to find products that need to be developed. The first step of the analysis phase is performance analysis, the second step is needs analysis, and the third step is concept analysis.

Performance Analysis. An analysis of performance is carried out to uncover potential issues that make Articulate Storyline 3 interactive learning media a viable choice in learning activities. At this stage, the researcher conducted interviews with science teachers and several eighth-grade students at SMPN 2 Balung. The teacher has never used interactive learning media such as Articulate Storyline 3. Students can also become bored when they are using less appealing learning tools, so the researcher concludes that it is necessary to innovate the development of interactive learning media Articulate Storyline 3.

Needs Analysis. To determine the learning material required by students in the online learning process, a needs analysis was undertaken. At this stage, the researcher conducted a questionnaire regarding the material that was mostly considered difficult by students. From 256 students, 65.9% of students said they

had difficulty learning science, particularly physics formulas. Due to its complexity and many mathematical equations, Newton's law is one of the materials whose concepts are difficult to grasp. Another factor that affects student learning difficulties is that students are not often given the opportunity to discuss the concept of force and motion. In addition, students are less involved in practicum or demonstration activities, so students do not master Newton's Law concepts well. Science learning by involving students in science practice can improve students' mastery of concepts and science process skills.

According to learning styles, 95.5% of students said that if they read well, it was easier for them to catch lessons; 97.7% of students said it was simple to understand the subject matter if they had a good understanding of the material; The subject matter given through demonstrations was easier to understand for 84.1% of students; 93.2% of students stated that pictures and animations were very helpful in remembering and understanding the lesson. This material will later be developed by researchers as a source of student learning.

Concept Analysis. In this phase, the researcher identifies the main concepts that will be taught to students. The concept analysis in question is in the form of the material's core competencies and fundamental competencies.

Design

At this stage, the product needs to be designed according to needs. The researchers designed the learning media to be developed at this stage, namely interactive learning media based on Articulate Storyline 3 on Newton's law material with a contextual approach at the junior high school level. To facilitate product manufacture, the first design begins in the form of a storyline synopsis or storyboard at this stage.

Develop

The development referred to in this case is developing the product. The learning media created was named Newton's law. The creation of learning media takes place in numerous stages, including:

1) Making Supporting Items

Items included in the media are instructions, basic competencies and indicators, materials, practical simulations, summaries, quizzes, references, and developer profiles.

2) Uploading Product Results



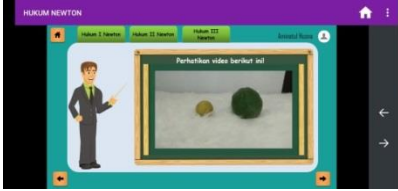
Articulate Storyline 3's output is in the form of web-based media (html5) or application files that may be run on a variety of platforms, including laptops, tablets, smartphones, and mobile phones.





3) Make an APK file

Making an APK file is the third stage of this media development stage. APK (Android package) is a file format for distributing and installing *software* and *middleware* on Android smartphones. The APK is created by Website 2 APK Builder. The step is to enter the html5 file's published results into Website 2 APK Builder. After that, check the intended product specifications, such as the APK outcomes' appearance and design. When finished, click generate APK to create an Android app. The application has been finished at this point.

This research has succeeded in developing interactive learning media based on Articulate Storyline 3 on Newton's law material with a contextual approach at the junior high school level, with a file size specification of 42.62 MB and a media format of APK, *various* features make it easier for developers to make media more interactive. The contextual aspects in the media in the form of learning videos containing simple experiments using materials that are around are shown in Table 6.

Table 6: Media Contextual Aspects

Media	Description
	A conversation about the inertia of a stone (Newton's first law)
	Video of a bus suddenly braked (Newton's first law)
	Video moving objects with varied masses (Newton's second law)

Media	Description
	Video pushing the table with varied forces (Newton's second law)
	Newton's third law in swimming
	Newton's third law in running
	Virtual lab with PhET.

In addition to those shown in Table 6, there are also other examples of Newton's law events that are often experienced in everyday life, which are visualized in the form of original images and animations.

Implement

This step entails validating experts, users (teachers), and students to conduct product testing. The product will be validated by three validators during the expert validation stage, including 1) one science lecturer as a material expert, 2) one science lecturer as a media expert, and 3) one science teacher from SMPN 2 Balung as a user validation expert. The validity test was carried out to determine whether the learning media that was made was feasible to be applied. Figure 2 shows the recapitulation of the validation and test results.

The material presented, according to the material expert, was in agreement with the learning objectives in the very good category, the material presented is in accordance with the characteristics of students in the good category, the material delivered is complete and systematic in the very good category, the material presented can be understood in the very good category. This statement is supported by Suswina (2016),

that the coherence of the material content makes it easier for students to learn and also guides students to get used to thinking coherently.

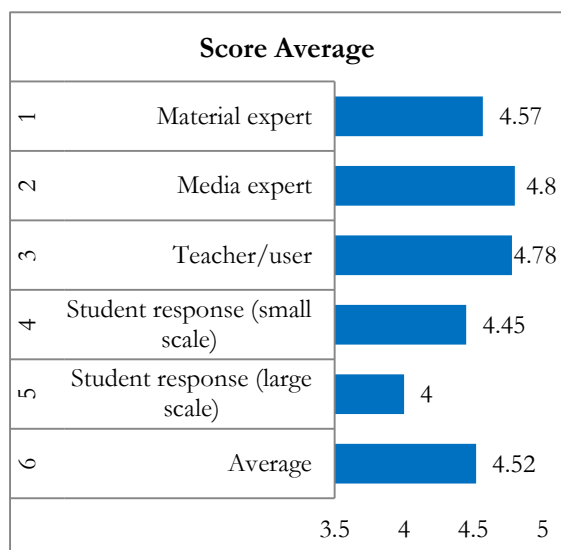


Figure 2: Recapitulation of Material Experts, Material Experts, Users (Teachers), and Student Responses Validation Results

According to the material expert, in the very good category, there were instances of procedural questions and how to handle them, there is a practical simulation that contains Newton's law material in the very good category, there is a summary of the material that has been studied in the sufficient category, the presentation of material in the media is accompanied by assignments or evaluations as student training materials in good categories. This statement is in line with Mirnawati et al. (2021). To present a topic and explain a subject, examples and illustrations are needed that can help and facilitate student understanding.

The results of the material specialists' evaluation yielded an average score of 4,57. Based on the conversion table, the value is included in the very feasible category, which lies in the range of 4,21 – 5,00. Based on the assessment of material experts, it can be concluded that the learning media is “very feasible” to be used as a learning medium.

Media experts said, the display design offered was in line with the characteristics of pupils in the very good group when it came to displaying design, the ability of the media in attracting students' attention in the very good category, the ability of the media to create a sense of pleasure for students in the very good

category. This statement is supported by Alhafidz & Haryono (2018), that the application is thought to be very feasible because it has been able to capture the attention of students in general.

On the aspect of ease of use of media, media experts said that the media was easy to operate by users in the very good category, media can be used on various devices in the very good category, the ability of the media to repeat what was learned in the very good category. Based on these findings, it can be stated that the practical application is used and feasible to be applied in the learning process. This statement is supported by Jazuli et al. (2017), that the practicality of a thing may be judged by how easy it is to use.

The assessment results by media experts obtained an average value of 4,80. Based on the conversion table, this value is included in the very feasible category, which is in the range of 4,21 – 5,00. Based on the assessment of media experts, it can be concluded that the learning media is “very feasible” to be used as a learning medium.

According to the teacher, the presentation of material in the media that is relevant to the real world or everyday life falls into the very good category, presentation of material in the media encourages students to make connections between the knowledge they have and their application in students' daily lives in the good category, the material in the media is knowledge-constructing and does not accept knowledge in the very good category. This statement is supported by Astiti & Hali (2019), that the teaching materials that are made must refer more to the contextual nature in which the sentences used in the material must be linked in everyday life. Furthermore, the information must include more realistic representations and appearances of items, pictures, concepts, and events.

The results of the assessment by users or teachers get an average value of 4,78. Based on the conversion table, this value is included in the very feasible category, which lies in the range of 4,21 – 5,00. It can be concluded, based on the opinions of material experts, that interactive learning media are “extremely feasible” to use as a learning medium.

The results of the small group trial student responses obtained an average value of 4,45. Based on the conversion table, this value is included in the very feasible category, which is in

the range of 4,21 – 5,00. The results of the large group trial student responses obtained an average value of 4,00. Based on the conversion table, this value is included in the feasible category, which is in the range of 3.41–4.20. Based on the comments of the students, it can be stated that interactive learning media are "very feasible" to use as a teaching tool. The conclusion is that the learning media is feasible" for use.

CONCLUSION

The resulting interactive learning media product is an application that can be used offline. The utilization of this product is relatively easy because the user only provides a mobile or android device. This media product also includes navigation buttons and usage instructions, making it easier for students and teachers to use it.

The level of feasibility of interactive learning media based on Articulate Storyline 3 on Newton's law material with a contextual approach at the junior high school level: 1) material experts obtained an average of 4.57, including the "very feasible" category. 2) media experts obtained an average of 4,80, including the category "very feasible". 3) users or teachers obtained an average of 4.78, including the category "very feasible". Students responded positively to this medium, with a 4,45 response rate in a small group trial. This value is included in the very feasible category. In the meantime, the big group trial received a score of 4,00. This value falls under the "feasible" category. Overall, the learning media can be described as "very feasible" for use as a learning medium.

The students' responses to the small group trial obtained an average score of 4,45. Based on the conversion table, these values are included in the very feasible and very attractive categories. The students' responses to the large group trial obtained an average score of 4,00. Based on the conversion table, the value is included in the appropriate category; based on the results of the large group of student responses; the media is categorized as interesting.

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