Development of E-Modules Based on Articulate Storyline 3 to Improve Accounting Cycle Learning Outcomes

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A R T I C L E   I N F O

A B S T R A K

Guru sebagai pelaku utama pembelajaran seringkali menggunakan metode pembelajaran yang tidak sesuai dalam menunjang hasil belajar siswa. Penelitian ini dilakukan dengan tujuan untuk menganalisis metode yang tepat untuk meningkatkan hasil belajar siswa melalui bahan ajar berbentuk e-modul berbasis Articulate Storyline 3 pada pembelajaran siklus akuntansi perusahaan jasa. Penelitian ini merupakan jenis penelitian RnD dengan model yang dikembangkan oleh Borg & Gall. Data dikumpulkan dari penilaian dua orang ahli melalui lembar validasi ahli, serta tanggapan dua orang guru dan 99 siswa melalui angket respon siswa. Hasil penelitian melahirkan produk berupa e-modul berbasis alur cerita artikulasi 3 yang dapat diakses oleh guru dan siswa dengan menggunakan HTML. Produk ini cocok digunakan oleh guru dengan metode yang tepat dan berimplikasi pada peningkatan hasil belajar siswa.

A B S T R A C T

Teachers as the main actors of learning often use learning methods that are not suitable in supporting student learning outcomes. This research was made in order to analyze the right method to improve student learning outcomes through teaching materials in the form of e-modules based on Articulate Storyline 3 on learning the accounting cycle of service companies. This research is a type of RnD research with a model that has been developed by Borg & Gall. Data was collected from the assessment of two experts through expert validation sheets, as well as responses from two teachers and 99 students through a student response questionnaire. The results of the research gave birth to a product in the form of an e-module based on the storyline of articulation 3 which can be accessed by teachers and students using HTML. This product is suitable for use by teachers with the right method and has implications for improving student learning outcomes.

1. INTRODUCTION

During the last few decades, there has been a great deal of research discussing learning outcomes. The attention of academics to the issue of learning outcomes has always been in-depth and broad, so that many methods and teaching materials have been created. This issue will indeed be important because it is based on the main orientation and goals of a student carrying out the learning process in an academic environment (Aulia et al., 2021; Han et al., 2022). In getting maximum learning outcomes, a student will go through a stage called the learning process for a certain period. Theoretically, learning outcomes can be defined as ways that students can do that previously could not be done and as a reflection of competence, patterns of action, values, understanding, attitudes, appreciation of students (Morton et al., 2023; Soedimardjono & Pratiwi, 2021; Woods et al., 2023). Learning outcomes obtained by each individual from a learning process that has been done (Harefa et al., 2020; Salamah, 2020; Syachtiyani & Trisnawati, 2021). The value obtained by students can show the results that have been achieved by students during the learning process in class, both in studying economics or other subjects (Hasan, 2022; Maysaroh et al., 2022).

This research is motivated by the ineffectiveness of teaching materials and methods used by teachers in learning, especially economics subjects. The economic learning process in the service company accounting cycle material becomes a problem when the teacher uses the lecture method and explains in the

learning process. Students only use the time to listen and record what the teacher says so that the teacher becomes the main actor who makes him smart himself (Wibowo & Pratiwi, 2018; Williamson et al., 2020). This makes students less initiative, creative, independent, and active because teachers who use various teaching methods practice various skills to attract students' interest in learning (Sanova et al., 2022; Wang et al., 2022; Xing & Qi, 2022). To get good learning outcomes, teachers must also use learning methods that are in accordance with the material presented so that students can easily understand the material well because the accounting cycle of service companies in economics is one of the subjects that are considered difficult for students, especially distance learning. away in the midst of the COVID-19 pandemic. Previous study said distance learning is basically a learning process that prioritizes independence, because the locations of educators and students are different (Fauziah et al., 2020). This allows teachers to improve learning methods that are of higher quality so that students can learn independently to improve their learning outcomes (Marantika, 2021; Wicaksana et al., 2022).

After conducting observations and interviews regarding student learning outcomes in economics subjects, we found problems with student scores that did not reach KKM 75. The data for assessing student learning outcomes from the previous semester is evidenced by the average grade XII IPS 1 is 69 ,5, class XII IPS 2 is 67.5, class XII IPS 3 is 70, class XII IPS 4 is 65.5, class XII IPS 5 is 74.5, and class XII IPS 6 is 69. In addition to the study results reviewed, there are several other factors that cause students' incompleteness in learning outcomes, namely students' understanding of the material that is not optimal, practicing accounting questions in online learning, the use of lecture methods that are not in accordance with distance learning conditions so that students lack initiative, creative, independent , and active, the limitations of teachers in finding references to effective and efficient teaching materials for online learning, and the need for instructional media teaching that is not yet appropriate and optimal in accordance with the implementation of the 2013 curriculum. Similar to what was revealed by previous study that accounting material is material that requires more activity analysis, so practice questions to solve transaction problems in each cycle must be updated, because of that the teacher also needs to determine the right learning strategy to overcome the problem of limited time in distance learning (Akbar et al., 2020). According to other study effective learning is learning that can optimally utilize information and communication technology as a tool (Hanum, 2013). With that, efforts to renew the use of technology results in the teaching and learning process are increasingly encouraged for effective learning.

One of the efforts to overcome the problems above is for teachers to improve the quality of learning with easier and more enjoyable learning methods. So that students are expected to follow the learning process well. This is in accordance with the study which states that the learning method that is thought to be able to increase the activity and learning outcomes of students lies in the teacher who acts as a facilitator, providing authentic, valid information, directing problems, giving instructions or orders that are in accordance with the power of thought. students so that they can solve problems, and focus on the goal of achieving competence (Sulistyawati, 2020).

From this case, it is necessary to develop interactive learning media, so that without direct explanation from the teacher, students can still learn independently, practically, easily accessible, fun, and can be learned at any time. Therefore, the teaching media that can be developed is an interactive e-module. This interactive e-module can be used by students to overcome distance learning constraints while at the same time providing convenience in accessing learning, especially in accounting lessons (Imran et al., 2022; Pratama Putra & Susilowibowo, 2021). In addition, previous study also explained that the electronic module is a form of presenting self-study materials presented in an electronic format that is structured and systematically arranged into the smallest learning unit in order to achieve certain learning objectives (Nurmayanti et al., 2015).

The existence of this e-module development is to support learning activities for students and also to support the needs of students in distance learning. In terms of developing the e-module, the researcher uses the articulate storyline 3 application which can assist researchers in making interactive teaching materials. According to previous study articulate storyline 3 is an application program that is supported by smart brainware in a simple way with interactive tutorial procedures to help users format CDs, personal web and word processing, through templates published both offline and online (Heliawati et al., 2022). This application is very useful for creating interactive e-modules and online learning. Articulate storyline 3 can be used to generate simulations, quizzes, drag and drop interactions, layer recordings, and many other e-learning objects that users can interact with.

The development of this accounting e-module is carried out using the Articulate storyline 3 application, teachers can adjust learning by using the Contextual Teaching and Learning (CTL) learning model that applies learning concepts that help teachers correlate between learning materials and the real lives of students. Previous study states that contextual learning is a learning concept that helps teachers connect subjects with real-world situations and motivates students to make connections between

knowledge and its application to their lives as family members, citizens, and workers (Hudson, 2012). The study conducted also showed a strong and positive influence between the CTL approach and improving student learning outcomes (Dewi & Alam, 2021).

In accordance with the needs of teachers in overcoming problems in the teaching and learning process, the researchers assume the need for a new innovation in the development of a learning system that is more attractive, interactive, effective and efficient in its use. In this regard, this study aims to develop learning media products in the form of e-modules based on Articulate Storyline 3 and further track the effectiveness of the use of these products in improving learning outcomes of service company accounting cycles.

2. METHOD

This study used the Research and Development (R&D) model developed (Borg & Gall, 1983), the stages of development can be seen in Figure 1.
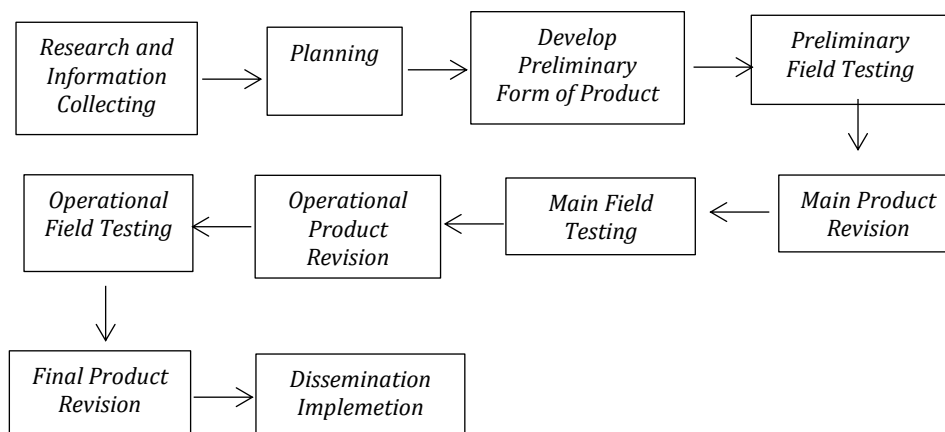

Figure 1. Development Stages

Figure 1 above shows the 10 stages of development carried out in this study, namely: 1) research and information collecting, 2) planning, 3) develop preliminary form of product), 4) preliminary field testing, 5) main product revision, 6) main field testing, 7) operational product revision, 8) operational field testing, 9) final product revision, 10) dissemination implementation.

All stages are carried out at SMAK Syuradikara Ende for the social studies class located in downtown Ende, East Nusa Tenggara Province. Sampling in this study used a purposive random sampling technique which involved testing the feasibility of product design from two experts, namely material experts and media experts. In addition to experts, teachers and students are also involved in determining the feasibility of the product. Meanwhile, to determine product effectiveness, nine student subjects were involved for the initial field trial, thirty student subjects for the main field trial, and sixty student subjects for the operational field trial.

Data collection techniques used test techniques to measure students' learning outcomes through pretest and posttest administration, while non-test techniques using questionnaires were used to determine the validation of material and media experts, teacher and student responses when using e-modules based on storyline articulation 3.

The data analysis technique used in this research is qualitative and quantitative data. Qualitative data comes from needs analysis data, input and suggestions for product validation from media expert validators, material experts, as well as input and suggestions from teacher and student response questionnaires. Quantitative data comes from product validation data from media expert validators, material experts, pretest and posttest results, as well as teacher and student questionnaire data on the product. The criteria for evaluating the instrument use the criteria proposed (Widyoko, 2011) as in Table 1.

Table 1. Feasibility Category Criteria

Score Interval	Criteria
$X < X_i + 1,8 . Sb_i$	Very Good
$X_i + 0,6 . Sb_i < X \leq X_i - 1,8 . Sb_i$	Good
$X_i - 0,6 . Sb_i < X \leq X_i + 0,6 . Sb_i$	Pretty Good
$X_i - 1,8 . Sb_i < X \leq X_i - 0,6 . Sb_i$	Not Good
$X < X_i . Sb_i$	Very Not Good

After testing the validity and reliability, the learning outcomes must be analyzed to determine the increase. This analysis was carried out using the normalized gain method. The categories of student learning outcomes are measured which is presented in Table 2.

Table 2. Gain Category Criteria

Interval	Category
$(g) \geq 0,7$	High
$0,7 \geq (g) \geq 0,3$	Medium
$(g) < 0,3$	Low

Furthermore, normality and homogeneity tests were carried out as prerequisite tests. After that, to find out whether or not there are differences in student learning outcomes using the product, it is necessary to test the hypothesis using an independent sample test.

3. RESULT AND DISCUSSION

Result

The results of this development show how the feasibility and effectiveness of the economic e-module in improving student learning outcomes, especially in the accounting cycle material for service companies. In the development of this economic e-module, there are three stages that will be explained, namely: the preliminary study stage, planning, and initial product development.

In this preliminary study stage, researchers have collected information through needs analysis from students. The analysis of student needs is carried out in two ways, namely: (1) Literature Study, in which researchers explore further information about learning references used by teachers and students in daily learning activities, it is proven that in the middle of distance learning (PJJ /online), teachers still use book sources which are used as a benchmark source in distance learning and monotony in the use of these book sources is considered less efficient because students only use powerpoint media which are not interactive and provide more theoretical explanations and rather than implementation on concept understanding. (2) Field studies, where researchers distribute questionnaires or questionnaires to students to find out their needs analysis, starting from knowing the obstacles or problems faced in the online learning system process, interest in online learning, facilities provided by the teacher during online learning, and the solutions that students get when they do not understand optimally the material given by the teacher.

At this stage the results that researchers have obtained are in accordance with the plans made, namely: (1) researchers analyze the core competencies (KI) that will be used in the economics learning e-module, (2) researchers analyze the materials that will be used in e-learning. modules based on source references obtained, (3) researchers compile material and make questions according to learning objectives in improving student learning outcomes, (4) researchers process and sort the draft of the economic e-module design into articulate storyline applications, (5) the researcher determines a suitable and interesting design in the draft of the e-module so that students do not get bored easily in using this e-module, (6) the researcher analyzes the learning characteristics of students, to determine the learning model that can be included in the e-module, (7) in the last step the researcher compiles research instruments in the form of validation sheets for material experts, media experts, teachers, students, and instruments to measure the ability of student learning outcomes.

The following is the front view of the cover and the main menu of the e-module product based on the articulate storyline 3 material for the service company accounting cycle as a learning medium that has been developed as show in Figure 1.

Figure 1. E-Module Display

The product development stage is carried out by compiling an initial draft of an economic e-module product based on articulate storyline 3 material for the accounting cycle of a service company. This stage produces a feasible product based on the assessment of media and material experts. The result is show in Figure 2.
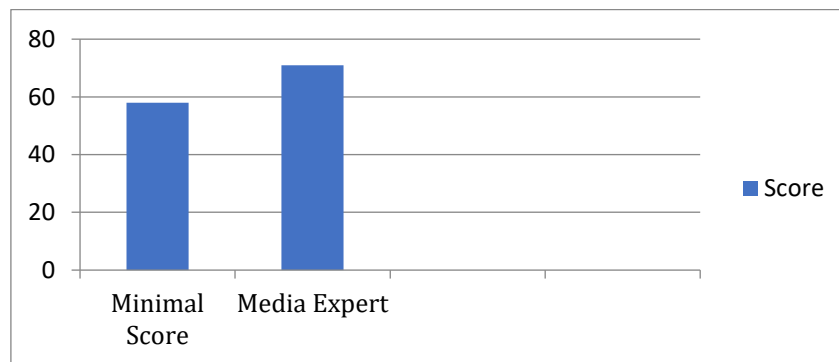

Figure 2. Product Feasibility Assessment Results by Media Experts

Based on Figure 2, it can be seen that the media expert's assessment score is above the predetermined minimum score of 71, while the conversion table for the media expert's assessment produces a B value in the "good" category. Product feasibility assessment results by material experts is show in Figure 3.
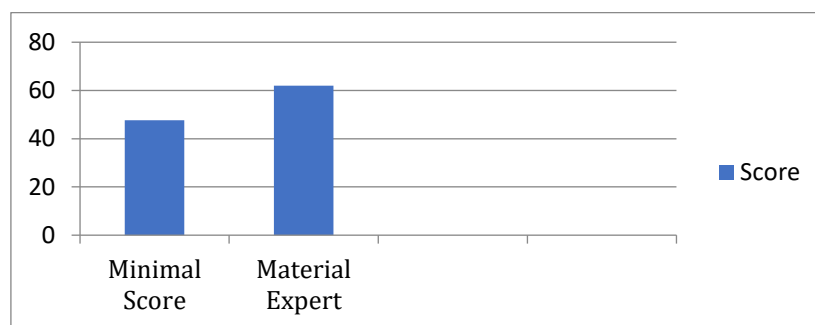

Figure 3. Product Feasibility Assessment Results by Material Experts

Based on Figure 3 it shows the material expert's assessment score which has the same value as a minimum score of 47.6 while the conversion table for the material expert's assessment produces an A in the "very good" category. The initial/limited trial phase was carried out on teachers and students of class XII IPS, there were 9 students, which can be seen in Figure 4.
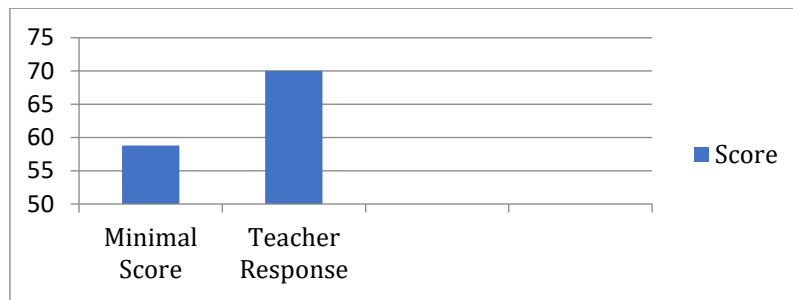
Figure 4. Teacher Response Results

Figure 4 shows that the teacher's assessment score is above the minimum predetermined value of 58.8 while for the conversion table, the teacher's initial response assessment produces a B value in the "good" category. Student response results is show in Figure 5.
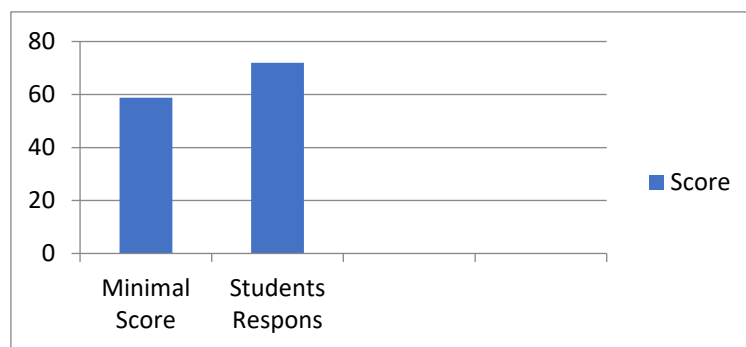

Figure 5. Student Response Results

Figure 5 shows that the student's assessment score is above the minimum value that has been determined, namely 72. The conversion table for the initial student response assessment resulted in an A grade in the "very good" category. The main trial/expansion stage was carried out on the same teacher and different students than before. The results of the responses of teachers and students of class XII IPS, which amounted to 5,000 people at this stage can be seen in Figure 6.
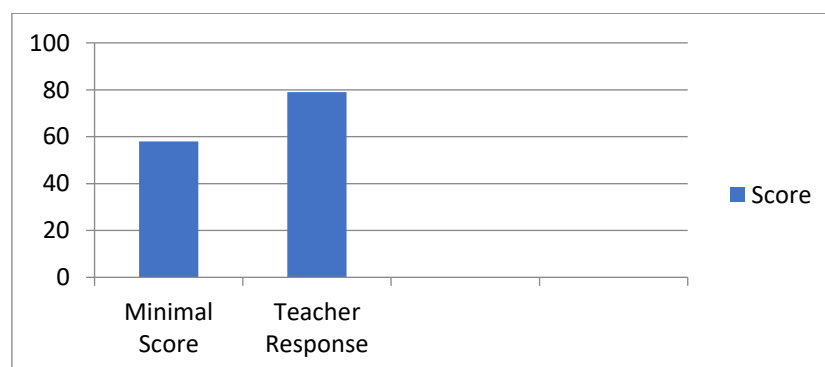

Figure 6. Main Test Results Teacher Response

Based on Figure 6, it can be seen that the teacher's assessment score is above the minimum predetermined value of 79. As for the conversion table, the main teacher's response assessment produces an A in the "very good" category. Main test results of student responses is show in Figure 7.
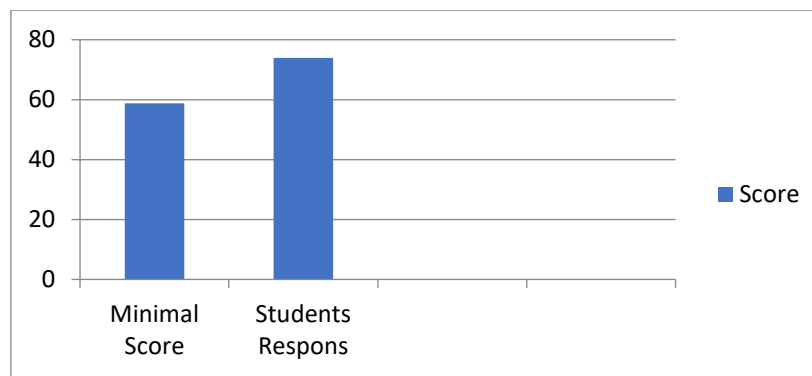
Figure 7. Main Test Results of Student Responses

Figure 7 shows the student response assessment score above the predetermined minimum score of 74.1 while for the table where the main student response assessment conversion results in an A grade in the "very good" category. Summary and data on the results of pretest and posttest scores in the learning outcomes of students in the experimental class and control class can be seen in Table 3.

Table 3. Gain Pretest and Posttest Standard Test Results

No.	Class	Average value		Average Gain Value	Criteria
		Pretest	**Posttest**		
1	Experiment	42.1	79	63.06	Medium
2	Control	41.9	62.5	34.63	Low

Table 3 shows that there are differences in the increase in learning outcomes of students in the experimental class and the control class. It can be seen that there is an increase in the average value of the experimental class by 79 which produces a gain value of 63.06 with the criteria of "medium", while the increase in the average value of the control class by 62.5 which produces a gain value of 34.63 with the criteria of "low". To find out the effectiveness of the articulate storyline 3 based e-module, an independent T-test is needed. However, previously, the data from the learning outcomes test in the form of experimental and control class scores on the posttest must first go through a prerequisite test, in this case normality and homogeneity tests.

In the Shapiro-Wilk section, the significance value of the overall posttest score for the class exceeds 0.05, the experimental class is 0.465 and the control class is 0.093 so it can be concluded that the data comes from a normally distributed population. The results of the homogeneity test show that the posttest significance value of learning outcomes in the experimental class and control class is 0.154, which means that the value based on the mean is more than 0.05, then the posttest data for learning outcomes also has the same variation or is homogeneous.

Independent T-test is used to determine differences in the improvement of learning outcomes by using an economic e-module based on articulate storyline 3 for students. The test was carried out using an independent t-test to find out whether there were differences in the learning outcome variables between the experimental class who were given treatment using the articulate storyline 3-based economic e-module and the control class that was not treated or did not use the articulate storyline 3-based economic e-module.

The criteria for drawing conclusions from the independent T-test are if the significance value is >0.05 then H_o is accepted and if the significance value is <0.05 then H_o is rejected and H_a is accepted. Below can be seen the data from the independent T-test variable learning outcomes shown in Table 4.

Table 4. Independent T-test Results of Learning Outcomes

Description		T	Sig (2-tailed)
Learning Outcomes Posttest	Equal variances assumed	5.891	0.000

Table 4 reveals the calculated data obtained by the value of sig. (2-tailed) < 0.05 which means H_o is rejected and H_a is accepted, the conclusion is that there are differences in student learning outcomes between the experimental class that uses the articulate storyline 3-based economic e-module and the control class that does not use the articulated-based economic e-module storyline 3.

The revision and final product stages are carried out by making various improvements to produce a final product in the form of an articulate storyline-based economic e-module 3. The assessment series consists of three stages, including: the first stage assessment carried out by material and media expert validators, the second stage assessment through initial/limited trial, and the third stage of assessment through main/expansion field trials. Of the three stages above, each has suggestions and comments on the product before conducting operational trials. After the operational trial was carried out, the researcher then revised the e-module based on the suggestions and inputs that had been obtained.

At this stage is the final stage, one of the requirements in the dissemination stage is that the product that will be used by students is feasible and effective to use. The results of this stage are the distribution of e-modules that have gone through several stages to arrive at product improvements and have been declared feasible and effective. Users in the implementation of this economic e-module product are students of class XII IPS at SMAK Syuradikara Ende. At this stage, which is the final process in the development and research of economic e-modules, researchers disseminate using digital platforms such as websites, which can later be accessed by students or people who need references in learning resources.

Discussion

In the process of stages developed based on the development model. From the results of these stages the preparation of e-modules requires an interactive learning media reference as did the researchers in this study. With the help of the articulate storyline 3 application, it can assist students in obtaining new learning resources, as well as optimal use of digital media, the learning process in this study, students can download via google drive or students can access directly via HTML or search engines on laptops or gadgets. This is in line with a research study conducted by other study that teaching in the form of e-modules is expected to help students understand, reason, try, and apply these teaching materials so that the learning process can run smoothly in accordance with the implementation or implementation of the curriculum 2013 (Tania & Susilowibowo, 2016). Not much different from that proposed by other study that an increase in student learning is due to the use of articulate storyline-based learning media which contains digital-based content that involves curiosity, challenge, relaxation, the effect of joy, where through this media students do not feel bored and can relieve stress, students also get new things from the use of current learning media (Setyaningsih et al., 2020). The novelty in this study is that it focuses on the material for the accounting cycle of service companies, there has not been previous research that has developed e-modules based on articulate storyline 3 specifically on this material.

Since this research discusses service company accounting cycle material and is proven to be able to improve student learning outcomes in class XII IPS, the researcher hopes that the development that will be carried out later will not only apply to class XII IPS, but teachers can use this development to cover other majors. In addition, in utilizing this learning media source based on the articulate storyline 3 application, researchers hope that teachers can be more innovative for not one media source that can create interactive e-modules, but teachers can use flipbooks, sigils, or other software-based media. which can assist teachers in making learning interactive and enjoyable for students.

Economics teachers and including researchers emphasize that these products are not only studied during learning hours, but can be accessed and studied at times outside of learning hours. This product is very easy to access via Google Drive and HTML software available on students' computers, laptops, notebooks, and smartphones, so they don't find it difficult to learn the material. In addition, during the learning process, students are also seen actively identifying, analyzing, asking questions to the teacher, and trying to solve problems at the end of each meeting, so that with this students can be stimulated to sharpen reasoning and have an impact on student learning outcomes. In accordance with what was stated by other study that Articulate Storyline 3 as interactive multimedia is very appropriate and practical to use because it is able to solve problems in each learning activity, so that it can encourage an increase in student learning outcomes (Nahdhiah et al., 2021).

The use of the economics e-module based on articulate storyline 3 in the experimental class and control class both contributed as seen from the increase in the posttest average score, but the scores obtained by the experimental class tended to be higher than the control class. So with this it can be concluded that there has been a significant increase in student learning outcomes in the experimental class compared to the control class. This finding is also supported by a preliminary study conducted by other one which confirms that the increase in the average score (mean) of the experimental class students is higher than the control class, this situation indicates that students who use interactive e-modules have higher better learning outcomes than students who use conventional learning (Linda et al., 2021). Another fact that became the findings in this study can be seen from the results of the independent t-test analysis which produces a significance value of 0.00 <0.05, meaning H_o is rejected and H_a is accepted, so the conclusion is that there is a difference in student learning outcomes between the experimental class who use a product

with a control class that does not use the product. The product developed in the form of an e-module also reinforces a number of previous studies, that e-modules that are interactive are proven to be able to overcome the obstacles of distance learning and provide convenience in accessing accounting learning (Imran et al., 2022; Pratama Putra & Susilowibowo, 2021).

From various studies that also underlie the findings in this research, the product is also a supplement for students to be more creative, initiative, independent, and active in learning even though learning is held online. Students also get good learning outcomes because the learning method has been adapted to the media and material, so that students find it easy to understand the material for the accounting cycle of service companies in economics subjects which so far have been considered difficult. Further research can be carried out by adding the population and sample, so that its dissemination can reach a wider range of schools and students. Due to the deficiencies in the articulate storyline 3 application, such as its features and visualization, we suggest that further researchers develop the media so that it is more up-to-date and comfortable for all people in learning.

4. CONCLUSION

This e-module economic product based on the articulate storyline 3 has gone through several stages in its development process and can be accessed using the articulate storyline 3 application. This product is declared feasible for increasing student learning outcomes because it has been validated by experts. In addition, the application of this product was also declared effective for student learning. This conclusion is explained through data on the average score of students' learning outcomes which have increased, this is known after measuring the pretest and posttest scores when given an action using an economic e-module based on articulate storyline 3.

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