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Effectiveness of Learning Media With Flip PDF Application in Improving Economic Learning Outcomes

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Abstract

Flip PDF is an audio-visual learning media that can be developed and accessed in the form of e-modules on most Android smartphones. Until now, teachers at SMA 1 Weleri Kendal in Central Java have not used technology as a medium or source of learning. Because the teacher's learning approach has fewer variations, it has an impact on student learning outcomes, which is not optimal, and they have never used learning media using interactive software such as Flip PDF. This research with the Research and Development method is based on J. Sweller's E-Learning Theory, which is a learning media theory that explains cognitive science principles in multimedia learning. The method of research and development used to create certain products, as well as the Borg and Gall Modification Model used to test the product's effectiveness and impact. Product validation and testing, Mann Whitney differential test, Normalized N-Gain, and Practicality Average were used to analyze the data. According to the findings of the study, the developed E-module with Flip PDF is valid and appropriate for use by validators, material experts, media, and students. The Mann Whitney test results show that there are significant differences in the students' pre-test and post-test after using Flip PDF in the learning process. On average, media and material experts consider Flip PDF e-module to be very practical and simple to use. Furthermore, students of SMAN 1 Weleri found the Flip PDF E-module to be very useful. E-modules are thought to be simple to use anywhere and at any time. The N-Gain test indicates that students who use e-modules with PDF flips improve their economic learning outcomes in a good way. The results of the field test show that it operates very well. Students discover that an e-module with a flip PDF is simple to use with a smartphone/notebook/computer because it can also be accessed online.

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INTRODUCTION

Education is a conscious effort to prepare students through guidance, teaching, and training activities for their future roles. The development of educational field is currently advanced (Rasiman. & Pramasdyahsari, 2014) . Obviously, it may have positive or negative impact (Weller, 2016) . The positive impact of educational field development is to facilitate learning activities with sophisticated technology (Zhang, Zou, & Wang, 2020) such as using internet to make students easier completing assignments (Rosyadi, 2004).

Students' attitudes and responsibilities are one of the indicators of educational success. Students who are in charge of assigned tasks are more likely to complete them on time (Rasiman & Pramasdyahsari, 2014) . Student responsibilities take the form of mandatory learning assignments (Afwan, Suryani, & Ardianto, 2020; Andini, Budiyono, & Fitriana, 2018; Febrianti, 2021; Hayati, Budi, & Handoko, 2015) . Students have to make reasonable decisions in order to account for the assignment of learning assignments. An optimal learning activity is critical based on those educational objectives. In a learning environment, learning is a process of interaction between students, educators, and learning resources. Learning is the assistance provided by educators to students in order for the process of acquiring knowledge and knowledge, mastering skills and character, as well as forming attitudes and beliefs to occur (Bergmann & Sams, 2012) , in other words, learning is a process that assists students in achieving success. The learning process cannot be separated from supporting factors such as learning media (Majid, 2008).

Learning media are teaching aids as used to improve the process of teacher-student interaction and student-student interaction with their learning environment (Sudjana & Rivai, 1991: 07). One of the primary functions of learning media is as a teaching aid that also influences the climate (Rudd, Aguilera, Elliott, & Chambers, 2017) , conditions, and learning environment (Min, Robbi, & Churiyah, 2021; Sugianto, Abdullah, Elvyanti, & Muladi, 2017; Wang & Du, 2021; Widjaja, Astra, & Wibowo, 2021) which are arranged and created by teachers to be conducive (Arsyad, 2013). Using learning media creatively can facilitate and improve learning efficiency, allowing learning objectives to be met (Garc, Fidalgo-blanco, Sein-Echaluce, & Conde, 2016) . The use of learning media is beneficial so that the teaching methods are not limited to verbal communication of words from educators so that students are not bored (A, Suryani, & Ardianto, 2020; Hidayatulloh, Wiryokusumo, & Adi Walujo, 2019; Kofler, Prattes, & Bergler, 2020; Ristanto, Mahardika, & Rusdi, 2021) , learning will attract students' attention that may foster learning motivation (Fitzgerald & Li, 2015), learning materials will be more easy understood by students (Arsyad, 2016).

Audio-visual learning media on Android-based smartphones in the form of e-modules or electronic modules are one type of learning media that can be developed at this time (Dore et al., 2018) . A driving factor for the development of Android learning media is learning media that is owned by many people, easily accessible by anyone, and can be done anywhere (ElAdl & Musawi, 2020) . Students and teachers can still carry out the learning process without having to meet face to face (Ummi & Erita, 2021) , so the time used will be relatively efficient because it does not reduce the effective hours of learning (Chellapan, Meer, Pratt, & Wass, 2018) . Continuous work allows teachers and students to fulfill their respective roles (Divayana, Suyasa, Ariawan, Mahendra, & Sugiharni, 2019) . Learning media on Android-based smartphones can be developed in a creative and innovative manner (Asmi, Dhita Surbakti, & C., 2018; Dawkins & Gavigan, 2019; Rahim, Suherman, & Muttaqiin, 2020; Sugianto et al., 2017) so that students are more interested and willing to accept subject matter on android learning media (Yamada, Goda, Hata, Matsukawa, & Yasunami, 2016) . Learning media's practical, adaptable, and personal nature will increase interest and motivation. (Plangsorn & Poopan, 2017) . The significance of creating interactive learning media in the form of e-modules to overcome the difficulty of explaining functions, working principles (Seruni, Munawaroh, Kurniadewi, & Nurjayadi, 2020) and applications to students (Sage, Krebs, & Grove,

2019) as well as time constraints in delivering material non-interactive (Rindaryati, 2021), it is critical to support learning media (Sage et al., 2019) in accordance with the needs of e-learning theory which explains the principles of effective multimedia learning cognitive science by using electronic education technology (Lohr, 2014) . As per research and cognitive theory, choosing the right multimedia modality can improve learning at the same time (Alsadoon, 2020) . This theory is an extension of the cognitive load theory developed by J. Sweller (Suardi, 2012).

According to the results of interviews with economics teachers, on Thursday 15 July 2021 at SMA Negeri 1 Weleri, one of the economics teachers stated "Economics lessons carried out at SMA Negeri 1 Weleri use economic textbooks and Student Worksheets (LKS), and learning resources are not fully developed utilize information technology. Learning is accomplished through a lecture method" (Researcher Observations on educators on October 9, 2021 at SMA Negeri 1 Weleri). The following table contains student responses to teaching materials used by teachers:

Table 1 Student Responses to Teaching Materials

Question	Answer		Percentage	
	Yes	Not	Yes	Not
Do you use textbooks in every lesson?	27	3	90%	10%
Do textbooks help understand the material?	18	12	60%	40%
Do you read textbooks outside of study hours?	12	18	40%	60%
Do you need innovative learning resources?	28	2	93%	7%

Source: Researcher Observation in class X IPS A on October 11, 2021 at SMA Negeri 1 Weleri.

Based on table 1 above, it is possible to determine whether or not schools lend economic textbooks to students. Most students use textbooks in every lesson (90%), and textbooks are quite helpful in understanding the material (60%), but most students do not read textbooks outside of study hours (60%) and they need more innovative learning resources (93%), so there is a need for more innovative, interactive, and high-quality teaching materials.

Mastery achievement of learning programs is also required to ensure that students achieve learning goals at the minimum stage or standards used in each lesson (Jabali & Walker, 2021) , particulary learning related to economics (Turban, King, Lee, Liang, & Turban, 2015) . Daily scores can be used to assess performance. The following is a recapitulation of daily test scores for social studies subjects at SMA Negeri 1 Weleri for consideration:

Table 2 Learning Outcomes SMAN 1 Weleri

Class	Total Student	Not Completed (< MCC)		Done (≥ MCC)	
		Total	%	Total	%
X IPS 1	33	23	70%	10	30%
X IPS 2	33	20	61%	13	39%
XI IPS 1	34	18	53%	16	47%
XI IPS 2	33	21	64%	12	36%
XIIIPS 1	34	20	59%	14	41%
XIIIPS 2	33	23	70%	10	30%
Amount	200	125	62%	75	38%

Source: SMAN 1 Weleri, 2020

Based on the table above, the daily test scores of economic subjects conducted by subject teachers at SMA Negeri 1 Weleri show that 62% have not passed MCC (Minimum Completeness Criteria), and students who have completed the KKM are only 38%, where the KKM value of Economics at SMA Negeri 1 Weleri is 75 children, indicating that the number of students who have not completed the KKM is still high.

Android learning media using the corporate edition PDF flip application is desperately needed (Althobaiti, 2020; Reck, 2020; Sadoux, 2021) as it has previously only used textbooks and worksheets (Komikesari et al., 2020) . Educators anticipate that will become more interactive so that students can see it audio-visually (Al Saadi, Lane-Kelso, Al Hafeedh, Zainab, & Al Wishahi, 2017). According

to research related to the corporate edition flip PDF application, the use of E-Books with the corporate edition flip PDF is effective (Weller, 2016) in training science process skills (Seruni et al., 2020) and has the potential to be developed into good learning media (Watin and Kustijono, 2017).

Problem formulation in this study is how Flip PDF application is valid for use in economics learning in improving learning outcomes for high school students (Asmi et al., 2018; Matson, 2012; Robinson, Reeves, Caines, & De Grandi, 2020; Saraswati, , Linda, & Herdini, 2019) as well as effective and practical on economic learning outcomes (Kusyanti, 2021). The following image helps to clarify the research concept:

RESEARCH METHODS

This is a Research and Development study (Rudd et al., 2017) based on J. Sweller's E-Learning Theory, which is a learning media theory that explains the cognitive science principles of effective multimedia learning using electronic education technology (Suardi, 2012 :04). The method of this research used to produce certain products and test the effectiveness and effects of these products based on ten steps to implement the Borg and Gall Modification Model's research and development strategy (Sugiyono, 2016), namely research and information collection, planning, product development. Following that, the data were analyzed using validation and product testing (Susilawati, Pramusinta, & Saptaningrum, 2020), a different test with the Mann Whitney test (Malaquias F., de Oliveira M. Fernanda F., & Albertin, 2021), Normalized N- Gain and Practicality Average (Lim, Liu, & Choo, 2020) .

Data collected through observation and questionnaires are primary data sources. The primary data sources in this study were the Economics teacher of SMA Negeri 1 Weleri as a material expert, the supervising lecturer as a media expert, and SMA Negeri 1 Weleri class X students as a means of product testing. Secondary sources are derived from literature studies and include books, journals, and other documentation. (Moore, Gillett, & Steele, 2014).

RESULTS AND DISCUSSION

The steps for creating an E-Module with Flip PDF begin with conceptualizing the material from the e-module that is adapted to basic competencies. Microsoft Power Point sheets contain blank space that will be used to insert videos. Save the document in PDF format. Next, find and select videos that correspond to the material on the role of economic actors in economic activities. Open the flip PDF application, then choose Create New Project, HTML5 in the Select Version dialog box, and OK. Following that, the import PDF (image) window will appear. Enter the prepared PDF file by clicking "browse," select the PDF file to be reversed, and then import now. Insert video or audio into the edit page window. To take a multiple-choice quiz or learning evaluation, click the OK button, drag the quiz column onto the flip sheet, enter information (e.g., click for multiple choice practice), add an action, then open the quiz and add a question. Fill in the blanks with the question and answer, then check the correct answer. Once finished editing, click save and exit. If necessary, choose a background from the template menu to make it more visually appealing. Apply the change, then publish or upload it online. The project's output can be published in a variety of formats, including HTML5, zip, exe, Mac app, mobile version, and burn to CD. The researcher publishes it in this e-module by uploading it online. Previously, researchers had to register an email address and a password for their work to be uploaded online.

At the start of the study, simple interviews with students and educators were conducted. Students claim to require learning media that includes not only text but also images, animations, and learning videos (audio-visual media). Educators have also never developed e-modules, so researchers feel compelled to create e-modules containing materials, images, simulations, and learning videos packaged using the corporate edition flip pdf application. To be valid and feasible, the e-module created in this study must be validated. Before the product was tested, the e-module was validated by material expert validators and media experts with the goal of learning the

validators' assessment of the e-module using the corporate edition flip pdf. According to the findings of this study, validators of material experts and media experts consider all items that must be validated on the e-module to be valid and accessible. The findings of this study are consistent with the research findings of Fonda & Sumargiyani (2018) and Butcher, Rodriguez, Chirhart, & Messina, (2016) whose research aims to determine the feasibility and validity of electronic module learning media (e-modules) on derived material using Scientific approach and the methodology Research and Development study. The findings of this study indicate that an e-mathematics module based on a scientific approach to material derived from class XI SMA in even semesters can be used in the classroom learning process (Fatonah & Yunianto, 2021).

The researcher's observations, questions and answers in the introduction show that if students are less than optimal in their use of existing textbooks, 60% responded that they do not use or read textbooks outside of class hours, students only use books during learning and when there is instruction from the teacher. Furthermore, the high percentage of students who have not completed MCC, 62% of daily test results have not completed MCC, and 38% of students who have completed MCC. In its implementation, the teacher's learning approach is less varied, resulting in less optimal student learning outcomes and indirectly necessitating more interactive e-module media such as Flip PDF. The following table shows the results of the Mann Whitney test:

Table 3. Results of Mann Whitney Test

	Mark
Mann-Whitney U	744,000
Wilcoxon W	3159,000
Z	-7.342
Asymp. Sig. (2-tailed)	,000
a. Grouping Variable: PREPOST	

Source: Primary Data Processed, 2022

Asyimp Value Sig in table is 0.000 less than 0.050, with a value of 744,000, indicating that there is a significant difference between students' pre-test and post-test results after learning with Flip PDF media. While the Mann Whitney test for each class displays the Asyimp value. Sig of 0.564 is greater than 0.050 with a value of 555,000, indicating that there is no significant difference in the learning outcomes of students in classes X IPS 2 and X IPS 3 after learning with Flip PDF media. The N-Gain test result was 0.43, which means moderate. This reveals that the improvement in economic learning outcomes of students who use e-modules with flip pdf is moderate or adequate.

Field trials and researcher observations revealed that it was very good in terms of operation or use. Students believe that the e-module using the flip pdf corporate edition can be used easily and effectively because it can only be accessed online using a smartphone/laptop/computer. In addition to material, the e-module contains images, audio, and video that aid in understanding the material. The findings of this study's discussion are consistent with Rindaryati's preliminary research (2021), which aims to develop an e-module using a professional flip pdf application in the subject of application of electronic circuits. The results of testing the function of the button on the e-module with black box testing were perfect. Furthermore, the average practicality test results are shown in the following table:

Table 4. Practicality Test E-Module Flip PDF

No	Appraiser Category	Score	Category
	Material Expert	4	Very practical
	Media Expert	3.7	Very practical
	learners	3.2	Practical

Source: Primary Data Processed, 2022

Based on the table above, it can be concluded that, on average, media experts and material experts consider e-modules with Flip PDF to be very practical, as they are simple to use and operate. This is also supported by the findings of SMA Negeri 1 Weleri students, who believe the

Flip PDF module is quite practical and easy to use anywhere and at any time. Students rate this practicality because there is no need to install any application; simply open the URL link in the default browser on a Smartphone or Laptop; even a Smartphone with low specifications can access it. This proves practicality and convenience because it does not require additional hardware or software to access (Horikoshi, Noguchi, & Tamura, 2016) . This is in consistent with the research of Oyaid & Alshaya (2019) who observed the use of e-modules, documented the benefits, problems and future prospects at several universities in Saudi Arabia and explained that almost all students considered the use of e-modules for educational purposes to be quite beneficial because they believe it is much cheaper, portable and easily accessible from anywhere.

The successful product was an e-module created with the flip pdf corporate edition application that was used to explain economic material, particularly the role of economic actors in economic activities. Following several stages of validation, small group trials, and field trials, the e-module developed was declared to be very good as a medium of economic learning for high school educators and students. Previous research concluded that interactive e-books created with the flip PDF application received a positive response from students and were appropriate for training students' higher order thinking skills. (Fatonah & Yunianto, 2021; Watin & Kustijono, 2017).

CONCLUSION

Before the product was tested, the material expert validators, media experts, and students developed and validated the e-module with Flip PDF. The outcomes have been declared valid and usable. The Mann Whitney test results revealed a significant difference between the students' pre and post test results after learning with Flip PDF media. While the Mann Whitney test per class revealed no significant difference in learning outcomes between students in classes X IPS 1 and X IPS 2 after learning with Flip PDF media. On average, media experts and content experts recognize e-modules with Flip PDF as very practical, as they are simple to use and operate. Furthermore, students of SMAN 1 Weleri thought the E-module with Flip PDF was very useful. This is because E-modules are thought to be simple to use anywhere and at any time. The results of the N-Gain test were in the medium range. This clearly shows that the improvement in economic learning outcomes of students who use e-modules with flip pdf is moderate or adequate. Researchers' field trials revealed that it was very good in terms of operation or use. Students believe that the e-module can be easily used by using this corporate edition flip PDF because it can be accessed online using a smartphone/laptop/computer. It contains material as well as images, audio, and videos that aid in comprehension.

Researchers can suggest that E-modules be used as reference material for all classes in order to increase knowledge in understanding economics material. Because this e-module contains practice/evaluation questions related to the material that the teacher has explained, the e-module that uses the flip pdf corporate edition on this economics material must have control from the teacher when the students are in the implementation of economic learning. Students should be more cautious when answering questions and completing practice evaluations. This e-module using flip pdf corporate edition is intended to be used as an example of how learning media can vary in economics. Teachers should use learning media that can pique students' interest and motivate them to study economics material, as well as create more comprehensive e-modules with more appealing and interactive designs. It is hoped that it will give birth to learning innovations, one of which is engaging learning media that will encourage students to be active and enthusiastic about studying economics.

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