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Development of a Problem Based Learning E-Module on Students Critical Thinking Abilities

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Abstract

Economic learning needs to be supported by learning media. In fact, at SMA Negeri 1 Kradenan, there is still little use of learning media. This learning media is really needed to realize students' critical thinking skills and learning motivation. It is necessary to develop an Economics E-Module as a learning medium. The research aims to determine the validity, effectiveness, critical thinking skills and learning motivation of students in learning using the Economics E-Module as a learning medium. The research method used is method *Research and Development* (R&D) 4-D. The research was carried out in class X of SMA Negeri 1 Kradenan, Kradenan District, Grobogan Regency. Non-test data was analyzed descriptively by percentage, while test data was analyzed using Mann-Whitney difference test analysis and analysis *n-gain*.The validation research results of expert lecturers obtained a very appropriate category, validation of economics teachers received a very appropriate category. Students' responses to the practicality of the Economics E-Module were categorized as very suitable for use, resulting in increased critical thinking skills and different learning motivation between the control class and the experimental class. The research concluded that the economics E-Module as a learning medium was declared very suitable by expert lecturers and economics teachers, effective for learning and able to improve students' critical thinking skills and learning motivation at SMA Negeri 1 Kradenan in the very good category.

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INTRODUCTION

Critical thinking is one of the abilities that is the goal of economics learning. Critical thinking is the most important goal of education which is not only important for student success in the classroom, but also as a lifelong skill (Putra et al., 2018). Critical thinking skills also draw on other skills such as communication and information skills, as well as the ability to examine, analyze, interpret and evaluate evidence (Suciono et al., 2021). These skills are process skills that must be achieved by Class X students in the Economics subject according to the Independent Learning Curriculum (BSKAP, 2022). Critical thinking skills are needed regarding solving problems in the economic field which are implemented in economics subjects at school (Sakdiyyah et al., 2022). Students who are now studying economics will become economic actors in the future. They will face a complex and rapidly changing business environment that requires critical thinking skills to make reasonable and wise decisions (Heijltjes et al., 2014). In other words, critical thinking is a skill that students need to participate in current economic learning and to solve problems as economic actors in the future.

The Economics lesson material in class X has 8 chapters and the most difficult thing for students to understand is the material on demand, supply and market balance. This material basically describes changes in demand and supply factors for an item in the form of a curve. Based on observation data from teachers who are also researchers, class X students at SMAN 1 Kradenan experienced great difficulty in determining market balance. The PBL-based economics e-module offers the presentation of real cases in society as information for students to learn to shift the supply and demand curve so that they are able to predict or determine market balance.

The use of digital technology can indeed be used to overcome learning problems in the classroom. For students who are currently quite used to electronic gadgets, integrating technology into learning will definitely arouse their interest and involvement in learning (Haleem et al., 2022). Technology-based learning provides several advantages such as accessibility of learning for everyone who wants to take part, suitability to student needs, scalability or the ability to accommodate learning in large volumes, and delivery of learning effectively and efficiently (Gudanescu, 2010). On the other hand, for teachers, technology can be used to plan and deliver learning content and improve communication between them and students (Mahini et al., 2012).

Among the various existing e-module creation technologies, Kvisoft Flipbook Maker provides its own advantages for Economics learning needs in the form of its ability to present text accompanied by motion animation, video and audio (Adhhan & Tanjung, 2022) (Wibowo & Pratiwi, 2018) so that the module be interactive and interesting (Maker & Motivation, 2020). This research focuses on the application of PBL-based e-modules which is different from previous research. Previous research focused on the development and use of e-modules and PBL separately to improve students' critical thinking abilities. The choice of integration between "e-module" and "PBL" accommodates economic learning needs. E-modules are needed to answer the challenge of an independent learning curriculum that technology must be a space for creativity, exploration and a place for children to learn (Sventy, 2023). Students who are currently in class Furthermore, Walstad, (1980) mentioned *problem solving* is the heart of the economy. This means that PBL is an important learning model in economics learning. Economics can be taught by generating new knowledge with the help of exposing students to real-life learning environments and experiences (Moos van Wyk, 2015).

The definition of critical thinking is an individual's ability to think rationally and logically which concentrates on making decisions regarding what to believe and what to do (Ennis, 2011). Meanwhile, Istianah (2013) believes that critical thinking is the process of reviewing an opinion in a more systematic direction, identifying something, selecting, reviewing, and improving it in a more specific direction. In line with that, (Karim, 2015) states that critical thinking is a step in gathering as

much information as possible to be able to assess something before making a decision.

Meanwhile, Fristadi & Bharata, (2015) stated that critical thinking is the process of evaluating or analyzing information in a problem based on what one thinks logically to make a decision. (Alec, 2008) argues that critical thinking is a form of active interpretation in observing and communicating good information in an argument. (Safrida et al., 2018) revealed that critical thinking is a cognitive activity that is linked to thinking in a critical analytical and evaluative way, which means going through a series of mental processes such as attention, categorizing, selecting and assessing.

Critical thinking can generally be summed up as the ability to think logically and make sense to examine and measure information before students make a decision to solve a problem. Improving critical thinking competence means increasing students' ability to interpret problems, capacity, elasticity and innovation in problem solving.

There are 4 objectives of critical thinking, including (1) evaluating an argument or opinion, including thinking and considering opinions that can be accounted for, (2) being able to take the initiative to develop new thoughts on problems, (3) practicing choosing various arguments, so that you can distinguish between appropriate and inappropriate arguments, (4) be accustomed to taking into account the realities that occur in real life to make conclusions (Sapriya in (Mardiana, 2019)). In line with that, (Ahmatica, 2016) explains several advantages obtained when emphasizing critical thinking skills in learning, including (a) learning activities become more meaningful, meaning that what is obtained from learning activities will become more lasting in students' memories; (b) can increase enthusiasm and enthusiasm for learning, both by teachers and students; (c) students are able to think scientifically; and (d) students have the ability to solve problems well, in learning activities in class and in everyday life.

Sam and Jacob (2008) suggest that indicators of critical thinking are: (a) formulating the main problem (*clarification*); (b) skills in providing evidence to produce correct opinions (*assessment*); (c) make logical conclusions from the results of the investigation (*inference*); (d) solve problems with various alternative solutions based on concepts (*strategies*). Meanwhile (Karim, 2015) quotes indicators of critical thinking from Facione, including interpretation, analysis, evaluation and inference. Almost the same as stated by (Sarigoz, 2012), that critical thinking means active thinking, evaluation or not instant thinking, thinking consciously about evidence and results, continuous evaluation of evidence and results, reflective or open to change and self-improvement, and under control.

This research uses critical thinking indicators from (Sarigoz, 2012). This is because this indicator is more complete and clearer than those described by Sam and Jacob (2008) and (Karim, 2015). This indicator comes from a scientist, Dewey. These indicators will be used to measure the effectiveness of the module in terms of students' critical thinking abilities in learning using e-based modules *problem based-learning.*

An electronic book or what is commonly known as an e-book is a display of information or manuscripts in book format that is recorded electronically using data storage media and can be opened and read using a computer or electronic book reader (Herawati & Muhtadi, 2018). According to Laili et al., (2019) Electronic modules are a form of presenting teaching materials, methods and evaluation methods that are systematically arranged and presented in electronic format. From the several definitions of electronic modules above, it can be concluded that electronic modules are a form of presenting teaching materials or containing material, including electronic evaluations that can be used in learning. The electronic module applied in this research is *Kvisoft Flipbook Maker* using class X economics material on the subject of Demand, Supply and Market Equilibrium.

According to Divayana (2018:35) *Kvisoft Flipbook Maker* is reliable software designed to convert PDF files into page turning digital publications or digital books. This software can change the appearance of a PDF file to make it more attractive, like a book. Besides that *Kvisoft*

Flipbook Maker You can also make PDF files into magazines, digital magazines, etc. Meanwhile, according to Sugianto (2013: 103), Kvisoft Flipbook Maker states that we can insert our digital books with image files, Portable Document Format (PDF), and video files in Flash Video (FLV) and MPEG-4 (MP4) formats. Meanwhile, the output produced from this software can be: *Hyper Text Markup Language* (HTML), *Executable* (EXE), *Zoning Improvement* (ZIP), and *Application* (APP).

Based on several related opinions about *Kvisoft Flipbook Maker* above, then *Kvisoft Flipbook Maker* is software for creating PDF (Portable Document Format) files into pages with a PDF extension that can be integrated with video and audio media. Each Portable Document Format (PDF) page can be flipped (back and forth) like a real book. This software will convert PDF files like digital books and is very easy to use to create realistic flash turning book pages. The use of Kvisoft Flipbook Maker media makes learning material easy to understand, easy to operate, there are elements of music and animation which are considered to increase students' motivation, interest and learning activities. Learning with *Kvisoft Flipbook Maker* In the future, it is hoped that it will be able to improve student learning outcomes and shape the character of students. Accurate selection of media and learning methods will greatly influence student learning outcomes.

RESEARCH METHODS

This research is experimental research with a research design *pretest-posttest control group* and *experimental group*. The research instrument used was a test. At the data collection stage the researcher used the test method. The test method is used to obtain an initial overview and learning outcomes after using the developed e-module and determine the increase in students' critical thinking abilities. The initial picture of students is seen using the pre-test that has been created. The description of critical thinking skills after using the e-module will use a post-test. Through pre-test and post-test scores, researchers will find out the increase in critical thinking skills achieved by students.

The subjects in this research were students of SMA Negeri 1 Kradenan class X for the 2023/2024 academic year which consisted of two classes, namely classes X.5 and Class X.5 was used as the control group and class X.6 was used as the experimental group, where both groups were taken from class The same.

Effectiveness of electronic modules (e-modules) with applications *Kvisoft Flipbook Maker* on students' critical economic thinking abilities using different tests. The indicator of success in this research is the difference in students' critical thinking abilities between the control group and the experimental group before and after using the e-module. To find out the differences in critical thinking abilities after using the economics e-module with the approach *problem based learning* (PBL) was analyzed with an independent difference test using SPSS 21.

RESULTS AND DISCUSSION

The results of this research discuss the use of economic e-modules using applications *Kvisoft Flipbook Maker* which was tested on students of SMA Negeri 1 Kradenan class X for the 2023/2024 academic year which consisted of two classes, namely class In this study, class X.5 was used for the control group and class developed.

Pretest and Posttest Average Table

Class	N	Average Value	
		Pretest	Posts
Class X5	36	36,97	30,93
Class X6	36	36,03	42,07

Source: Primary data processed

The table above shows the average score results from classes X5 and X6. The average pre-test score for class X5 was 36.97 and X6 was 36.03. Meanwhile, the average post-test score for class X5 was 30.93 and X6 was 42.07. So it can be concluded that the average grades for classes X5 and X6 are equivalent before being given treatment (*treatment*).

Next, a normality test was carried out first to determine whether the post-test scores between the experimental class and the control class were normally or not normally distributed. After the normality test is carried out, the next step is to

determine the parametric test (*Independent Sample T-Test*) or non-parametric (*Mann Whitney Test*).

Normality Test Table for Experimental Class (X5) and Control Class (X6)

	Statistic	df	Say.
Experiment	.131	36	.125
Control	.200	36	.001

Source: Data Processing

Based on the results of the SPSS test in the table above, the Sig. for the experimental class is 0.125 > 0.05 and the Sig. for the control class is 0.001 < 0.05. So, it can be concluded that the data from the experimental class is normally distributed and the data from the control class is not normally distributed so that the difference test is carried out using a non-parametric test, namely *Mann Whitney Test.*

Table of Mann-Whitney Test Results

	Testing	
	Pretest Results	Posttest Results
Mann-Whitney U	631.000	447.500
Wilcoxon W	1297.000	1113.500
WITH	-.193	-2.283
Asymp. Sig. (2-tailed)	.847	.022

a. Grouping Variable: Kelas

Source: Primary Data Processing

Based on the results of the Mann-Whitney test, it can be seen that the value of Asymp.Sig. (2-tailed) is 0.022. Because this value is smaller than 0.05, it can be concluded that "The hypothesis is accepted". This means that there is a significant difference between the PPh 21 exam results for the Pre-Test and PostTest. Thus, it can be concluded that the use of economic e-modules by using applications *Kvisoft Flipbook Maker* effectively improving the critical thinking skills of students at SMA Negeri 1 Kradenan class X.

Critical thinking skills are the process of evaluating or analyzing information in a problem based on what one thinks logically to make a decision (Fristadi & Bharata, 2015). Meanwhile, Alec (2008) believes that critical thinking is a form of active interpretation in observing and communicating good information in an argument.

A part from that, critical thinking is a cognitive activity that is linked to thinking in a critical analytical and evaluative way, which means going through a series of mental processes such as attention, categorizing, selecting and assessing (Safrida et al., 2018). Therefore, it can be concluded that critical thinking is the ability to think logically and make sense to examine and measure information before students make a decision to solve a problem.

In this study, two classes were used, namely classes X.5 and X.6. Used in this research class X.6 was used for the experimental group and class X.5 was used for the control group. In table 4.8 and figure 4.8 in the control class, the average pre-test score was 63.75 and post-test 76.25 from 36 students. In the experimental class, the average pre-test score was 63.06 and post-test 82.08 from 36 students. Effectiveness of electronic modules (e-modules) with applications *Kvisoft Flipbook Maker* on students' critical thinking abilities using independent difference tests. In different tests *Mann-Whitney Test* In Table 4.9, the results show a sig value of 0.02 < 0.05, so it can be concluded that the research data has different critical thinking abilities between the control class and the experimental class, meaning that the e-module product was developed with an application. *Kvisoft Flipbook Maker* proven to be effectively applied in economics learning.

The results of this research are in line with research conducted by Getuno (2015), the results of the research showed that there was a difference in scores from the pre-test to the post-test which was found to significantly increase the attitude score of one group taught using the e-learning module compared to the group taught using the module. conventional method. Another research by Janah (2018) based on the research results can be concluded that the model *Problem Based Learning* influence and contribute to improving students' learning outcomes and science process skills. Other research by Rerung (2017) shows that the application of the PBL learning model can improve student learning outcomes. Putri (2020) where learning using e-modules was stated to be effective in learning and had a big impact in improving learning outcomes.

CONCLUSION

The research results show that the use of e-modules with applications *Kvisoft Flipbook Maker* improve the critical thinking skills of students at SMA Negeri 1 Kradenan class X for the 2023/2024 academic year. Economics E-Module with applications *Kvisoft Flipbook Maker* can be used as an alternative to previous learning by providing innovative teaching resources to support the economic learning process in schools. This Economics E-Module is very feasible and effective for use as a learning resource in class and independent learning.

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