



Social Learning E-Module for Optimizing Critical Thinking Skills

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ABSTRAK

Digitalisasi pembelajaran menjadi sebuah kepatutan sebagai bentuk penyesuaian diri dalam menghadapi tantangan abad ke-21. Permasalahan yang dihadapi adalah bahan ajar yang sesuai dengan karakteristik peserta didik belum dikembangkan secara baik, terlebih bahan ajar digital yang juga turut menopang peningkatan keterampilan berpikir kritis sebagai salah satu keterampilan abad ke-21. Penelitian ini bertujuan mengembangkan bahan ajar digital (e-modul) pada pembelajaran ilmu pengetahuan sosial untuk mengoptimalkan keterampilan berpikir kritis peserta didik. Desain penelitian ini merujuk pada penelitian pengembangan Rowntree yang meliputi perencanaan, pengembangan dan evaluasi. Uji efektivitas e-modul dilakukan menggunakan one group pretest-posttest design. Subjek penelitian adalah peserta didik kelas VIII sebanyak 104 peserta didik. Pengumpulan data dilakukan melalui wawancara, observasi, angket dan tes esai. Analisis data menggunakan paired samples test, dengan uji prasyarat data berdistribusi normal dan homogen. Hasil pengujian yang dilakukan menyatakan bahwa data penelitian berdistribusi normal dan homogen. Hasil uji paired samples test menyatakan bahwa e-modul pembelajaran ilmu pengetahuan sosial memiliki kontribusi positif dan signifikan. Disimpulkan bahwa e-modul pembelajaran ilmu pengetahuan social efektif digunakan untuk mengoptimalkan keterampilan berpikir kritis peserta didik.

ABSTRACT

Digitalization of learning is appropriate as a form of adjustment in facing the challenges of the 21st century. The problem faced is that teaching materials that are on the characteristics of students need to be developed properly, especially digital teaching materials, which also support improving critical thinking skills as one of the 21st-century skills. This study aims to develop digital teaching materials (e-modules) in social science learning to optimize students' critical thinking skills. The research design refers to Rowntree's development research which includes planning, development and evaluation. The e-module effectiveness test was carried out using a one-group pretest-posttest design. The research subjects were 104 class VIII students. Data was collected through interviews, observation, questionnaires and essay tests. Data analysis used the paired samples test, with the prerequisite test data being normally distributed and homogeneous. The tests' results stated that the social science learning e-module had a positive and significant contribution. It was concluded that social science learning e-modules were effectively used to optimize students' critical thinking skills.

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1. INTRODUCTION

Digitization of learning is a propriety that must be followed by every element of education, bearing in mind that current technological developments demand renewal in the administration of education. This condition is in line with the challenges of the 21st century, that everyone must have various skills such as learning innovation, digital literacy and life skills (Chu & Reynolds, 2017; Prayogi & Estetika, 2019). Understanding that this era is an era that emphasizes the synergy of skills with the use of technology, education and learning providers must play a role in preparing a generation that is able to compete and respond to these challenges (Geng et al., 2019; Tondeur et al., 2017; Weng & Chen, 2020). The role of an educator to answer this challenge is to innovate, one of which is through the development of teaching materials based on digital technology, so that students can learn anywhere without being limited by space and time (Ramadhani & Zulela, 2020; Tondeur et al., 2021). In this regard, it is realized that not only educators in the field of technology can organize digital learning, but every educator can do it. As is the case with learning social sciences (IPS), as learning that directs students to become a democratic society, responsible, and play a role in world peace through comprehensive and integrated learning can also utilize digital teaching materials in the learning process (Berndt et al., 2021; Maharani & Kristin, 2017; Rustantiningsih, 2018; Sapriya, 2017).

Digital teaching materials that can be used by educators include e-modules (Sofyan et al., 2019; Syahrial et al., 2021). The preparation of e-modules as digital teaching materials is relatively the same as

conventional modules, it's just that the material compiled is systematically integrated and packaged in the form of practical learning units that can be accessed anywhere and anytime (Darmaji et al., 2019; Nisa et al., 2020; Rahayu & Sukardi, 2021). E-modules as digital teaching materials are suitable for development at this time, considering the characteristics of current students who like learning on a digital basis, as well as other characteristics it is believed that students have independence in learning (Nisa et al., 2020; Rahayu & Sukardi, 2021; Silalahi, 2020). Understanding the current conditions, it can be understood that e-modules are appropriately used to optimize each student's learning activity. Moreover, when learning is held in a hybrid manner, e-modules are appropriate learning materials to use (Hidayat et al., 2022; Mauliana et al., 2022).

The IPS learning e-module that is being developed is of course based on the needs of students, as stated that to support learning which is currently growing, interesting learning materials are needed so that learning becomes more enjoyable, especially digital-based learning materials (Rahmatika et al., 2020; Serevina et al., 2018; Syahrial et al., 2021). To support the statement about these needs, the condition of readiness to use the technology was also analyzed, and the results stated that most students had devices that were capable of being used in learning (Hendayani, 2019). Reviewing that learning readiness with e-modules is appropriate, it further emphasizes that e-modules need to be developed to support the implementation of digital-based learning. In addition, e-modules are an alternative learning material that also supports the achievement of 21st century skills (Aufa et al., 2021; Sari & Manuaba, 2021; Serevina et al., 2018). As these skills are needed for the alignment of education with the current social environment. There are various 21st century skills, such as learning innovation, digital literacy and sustainable living skills (Chu & Reynolds, 2017). Each of these skills has sub-skills which include critical thinking skills (Wagner, 2010).

Critical thinking skills are skills that are needed by everyone in order to analyze the surrounding conditions, in order to determine certain actions. As stated that critical thinking skills are reflective and productive thinking skills, which involve evaluating evidence so that it can determine its relevance to a truth (Jiwandono, 2019; Pradana et al., 2020; Shaw et al., 2020). It can also be understood that critical thinking skills start from basic clarification, essential support, interference, and further clarification (Alghafri & Ismail, 2014; Andriani & Suparman, 2019). In line with the statement that critical thinking skills are a cognitive activity, which is related to the use of the mind. As critical thinking means doing an analysis and evaluation that involves attention, categorization, selection, and assessment of a situation (Amin et al., 2020; Kurniawan et al., 2020). If critical thinking skills are associated with learning, then they have relevance because optimizing critical thinking skills requires an adequate environment.

An adequate environment is intended as a condition for assimilation between students, because each person has his own perspective on a condition, so everyone's critical thinking skills are honed. Through effective learning, it is believed that critical thinking processes can be embedded in students. To achieve effective learning, this can be done in various ways, such as utilizing technology, which has now been integrated into learning. As explained that the intended integration of technology in learning is to utilize e-modules, which means that teaching materials are arranged contextually and can be used anywhere and anytime. E-module has characteristics that can be used independently by students (Darmaji et al., 2020; Priantini & Widiastuti, 2021; Rahayu & Sukardi, 2021). Previously, research on the use of e-modules to improve critical thinking skills has proven effective in exact learning (Fadieny & Fauzi, 2021; Febriana & Sakti, 2021; Febriani & Ratu, 2018). For this reason, the development of e-modules in social learning also needs to be done to optimize students' critical thinking skills. Of course, to train students to be able to optimize critical thinking skills through e-modules, students must have confidence in their abilities, and respect every process in critical thinking (Stupple et al., 2017). For this reason, the process of critical thinking should be initiated and trained from school age through various forms of learning, one of which is utilizing e-modules. This study aims to develop digital teaching materials (e-modules) in social science learning to optimize students' critical thinking skills.

2. METHOD

This research was conducted with reference to the research and development design. Development research is research conducted to produce a novelty, or renewal of something that has existed before (Kumar, 2011). The development model used is the Rowntree model which consists of three stages, namely planning, development and evaluation (Rowntree, 1995). For the evaluation process, it is carried out according to the formative evaluation stages, starting from self-evaluation, one-on-one tests and expert reviews, small group tests and field tests (Tessmer, 1998). To obtain accurate data, the researchers used various data collection techniques, namely interviews, questionnaires, observations, tests and documentation. Interviews were conducted to confirm various findings, especially when conducting needs analysis, expert reviews and the practicality of using the developed e-module. For this reason, interviews were conducted using interview guidelines, which were then analyzed descriptively. Questionnaires are used to measure the level of validity and practicality, in which the

analysis is carried out quantitatively through scoring. Determine the level of validity and practicality of using e-modules, the criteria in [Table 1](#).

Table 1. E-Module Validity and Practicality Categories

No	Score Range	Category
1	$X > \mu + 1.5\sigma$	Very Valid / Very Practical
2	$\mu + 0.5\sigma < X \leq \mu + 1.5\sigma$	Valid / Practical
3	$\mu - 0.5\sigma < X \leq \mu + 0.5\sigma$	Valid Enough / Practical Enough
4	$\mu - 1.5\sigma < X \leq \mu - 0.5\sigma$	Invalid / Impractical
5	$X \leq \mu - 1.5\sigma$	Totally Invalid / Highly Impractical

(Azwar, 2012; Jihad & Haris, 2012)

As for other techniques, namely observation is used to observe students' critical thinking activities in learning, so observation sheets are used in accordance with indicators of critical thinking skills, while analysis of criteria for critical thinking activities is carried out quantitatively through scoring. Tests are used by researchers to measure the level of critical thinking skills, as test items are prepared according to indicators of critical thinking skills and are analyzed by means of scoring to determine the level of skill achieved. To determine the level of students' critical thinking skills, showed in [Table 2](#).

Table 2. Categories of Students' Critical Thinking Skills

No	Score Range	Category
1	86 – 100	Very Critical
2	70 – 85	Critical
3	56 – 69	Pretty Critical
4	40 – 55	Not Critical
5	0 – 39	Very Not Critical

(Komalasari, 2017)

After knowing the level of students' critical thinking skills, then determining the effectiveness of using e-modules in optimizing students' critical thinking skills. To test or analyze the effectiveness of the e-module, a statistical test is carried out, namely the "t" test or paired sample test.

3. RESULT AND DISCUSSION

Result

The research was conducted in a structured manner, as it was stated that a structured process would produce meaningful information. As previously described, the development of social learning e-modules is carried out to optimize students' critical thinking skills. This is based on the relatively low condition of critical thinking skills. It should be noted that this research was conducted at three junior high schools in Kayuagung, Ogan Komering Ilir. The initial condition of students' critical thinking skills can be observed in [Figure 1](#).

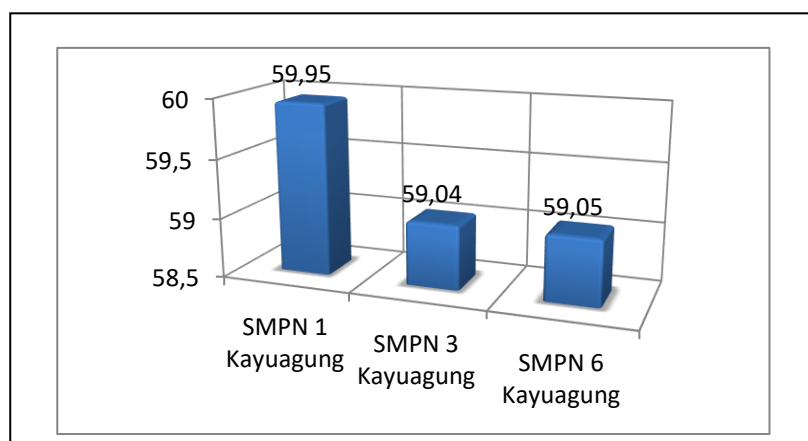


Figure 1. Initial Conditions of Students' Critical Thinking Skills

Referring to [Figure 1](#), it is clear that students' critical thinking skills are relatively low. When looking at the picture, it can be seen that the students in SMPN 1 Kayuagung have higher achievements compared to the other groups, it's just that the differences between the three groups of students are stated to be insignificant because they are still in the same range of values, only the achievements are different after the decimal point. After knowing the existing conditions, the researchers also carried out the stages of the process of developing social learning e-modules. Beginning with planning, which includes a needs analysis. Through interviews, researchers obtained information that teachers also need alternative learning materials that are in accordance with the current characteristics of students, considering that students have a habit of seeking information on learning materials through their devices. Therefore, teachers feel that learning materials need to be prepared according to these conditions, so that students and teachers have the same perception of the material studied through tested sources. To confirm this need, the students also confirmed, their responses were consistent that currently the use of gadgets to obtain learning information is a trend, so learning materials that are in line with the theme and presented in digital form are urgently needed. After conducting the interviews, the researchers distributed questionnaires to find out the level of student needs related to the social learning e-module. The results of the analysis of the level of student needs can be seen in [Table 3](#).

Table 3. Student Needs (E-Module)

No	Percentage	Category
1	85.19%	Requires e-module
2	14.81%	All you need is an e-module

Based on the results of the needs analysis conducted through a questionnaire, it is clear that most students stated that they needed e-modules for use in social learning. This certainly emphasizes that the development of e-modules is important in order to support digital-based learning. Henceforth, the research stage is continued, namely developing e-modules. The social learning e-module development stage begins with identifying instructional objectives. Identification of instructional objectives is intended as a form of study regarding the focus that students should learn, so that with this identification, the learning process using e-modules can be aligned and sustainable. Based on the identification results, it is stated that through learning with e-modules, students can describe the advantages and limitations of inter-spatial as well as the role of economic actors in an economy clearly and precisely; able to describe inter-island trade clearly and precisely; can describe clearly and precisely regarding trade between countries; be able to analyze the appropriate model of strengthening the maritime and agricultural economy to be implemented; as well as having the ability to perform a clear and precise analysis of income redistribution.

The development process continues at the stage of formulating the outline of the material, as the goals are expected to be achieved in learning with e-modules, so the material prepared is aligned with these goals. In this study, the outline of the material compiled in the e-module is the advantages and limitations of inter-space and the role of economic actors in the economy, inter-island trade, trade between countries, models of strengthening the maritime and agricultural economy and redistributing income. Through the outline of the material that has been determined, the researcher then arranges the material to be presented in the e-module. The preparation of the material was carried out by researchers using a combination technique, namely writing alone and compiling from various relevant sources. After the material is well organized, then the material is then presented in digital form so that it becomes an e-module prototype that is ready to be produced or developed.

The next stage is evaluation, namely testing the e-module prototype so that it can be declared valid, practical and effective for use in learning. The first evaluation to be carried out is an internal evaluation or self-evaluation, namely the researcher as a developer makes an objective assessment of the e-module prototype. The results of the self-evaluation put more emphasis on writing and other technical aspects, so the results of this self-evaluation were then referred to as prototype 1. Furthermore, prototype 1 was tested again through expert review. Expert review testing was conducted to measure the level of validity of the developed e-module. The results of the expert review regarding the validity level of prototype 1 in [Table 4](#).

Table 4. E-Module Validity Level

No	Description	Score	Category
1	Learning design	77.70	Valid
2	E-module design	78.67	Valid

Based on the results of the analysis from the expert review, the prototype 1 e-module that was developed was declared valid. This means that prototype 1 can be used for the next testing process. Subsequent

evaluations were carried out by means of a one-to-one test, namely students using the developed e-module were then asked to provide an assessment. In this test, the main objective is to find out students' responses regarding the clarity of information and appearance of the e-module, as well as the practicality of its use. The results of the one-on-one evaluation show that aspects of the use and materials contained in the e-module are clear and easy to understand. In the end regarding practicality, students gave various responses, with the substance remaining the same, namely stating that the IPS learning e-module developed by researchers was practically used in learning. The argument expressed by students is that with the e-module, learning can be done more easily anywhere, especially when you have to repeat learning because the e-module does not seem to be studying while in a certain location, it is different from using a printed book, you have to open it. and seem not so pleasant when in certain locations. Another thing that is the focus of students is the easier use of e-modules so that learning time can be done at any time. After being stated clearly and practically related to the e-module obtained through a one-to-one test, the researcher conducted a confirmation test regarding the practicality of using the e-module through a small group test. The results of testing in small groups in [Table 5](#).

Table 5. Practicality of Using E-Modules

No	Percentage	Category
1	44.83%	Very Practical
2	55.17%	Practical

Based on the results of the analysis carried out in the small group test, it is known that the majority of students state that the social learning e-modules developed are practical for use in learning. So, the developed e-module has met the criteria of validity and practicality as learning materials for students. For this reason, e-modules that have been declared valid and practical are subject to final stage testing, namely field testing. This test was held considering that the e-module was developed not only as an alternative learning material for students but also developed to optimize critical thinking skills. For this reason, the testing process at the field test stage is testing on students who are following the learning as they should. To find out the critical thinking skills possessed by students, the researchers conducted observations or observations and essay tests according to the material developed in the e-module.

Observation which means observing the activities of students according to the criteria or observation indicators that are relevant to critical thinking skills. There are eight points that are the focus of observation of critical thinking skills, namely focusing statements, analyzing arguments, debriefing and clarifying, considering the credibility of a source, observing and considering results, making decisions, identifying assumptions, and deciding on an action (Komalasari, 2017). Based on observations made by researchers, it is known that students' critical thinking activities are expressed as varied or diverse. For more clarity regarding the results of observations made, it can be seen in [Table 6](#).

Table 1. Students' Critical Thinking Activities

Number	Percentage		Category
	P.1	P.2	
1	-	-	Very Critical
2	4.81%	15.38%	Critical
3	74.04%	78.85%	Pretty Critical
4	20.19%	4.81%	Not Critical
5	0.96%	0.96%	Very Not Critical

Based on [Table 6](#), it can be understood that none of the students was stated to have very critical thinking activities, both in the first and second observations. It's just that, there are still 0.96% of students who are stated to be very uncritical in their learning activities. This is certainly a note for educators, so special assistance is needed so that they can be more critical in participating in learning. In the non-critical category, there was a decrease in the percentage from 20.19% in the first observation to 4.81%, of course this condition is a positive indication. That is, students who were previously uncritical in participating in learning became more critical. This condition is indicated by the percentage increase that occurs in the moderately critical and critical categories. In the moderately critical category, initially it was 74.04%, increasing to 78.85%, which means that students are becoming more critical in participating in learning by utilizing the developed e-module. Similar to the critical category, in the first observation only 4.81% of students were observed to have critical learning activities, but in the second observation there was an increase of 10.57% so that in the second observation as many as 15.38% of students were categorized as critical in participating organized learning. This condition is

certainly a happy thing, descriptively the e-module can be declared effective for increasing students' critical thinking activities in participating in learning.

After understanding that the developed e-module can increase students' critical thinking activities, then a test is then carried out to assess the achievement of students' critical thinking skills. The tests carried out are a form of deepening the cognitive aspects of students. The intended test is a test that is in accordance with the material being studied, it's just that the process of preparing test questions and answers is expected to have certain criteria in accordance with the critical thinking skills that should be owned. The indicators used by researchers in giving tests are simple explanations, building basic skills, the ability to conclude, develop further explanations, and the ability to organize strategies or tactics (Komalasari, 2017). For this reason, the test questions are composed of five items with twelve sub-questions, which are structured to describe the ability of each indicator and sub-indicator. Overall, the results obtained by students in answering test questions before learning to use the e-module (pre-test) and after using the e-module (post-test) in Table 7.

Table 2. Student Critical Thinking Skills Test Results

Number	Percentage		Category
	Pre-test	Post-test	
1	-	3.85%	Very Critical
2	63.46%	94.23%	Critical
3	34.62%	1.92%	Pretty Critical
4	1.92%	-	Not Critical

Examining the information presented in Table 7, it can be seen that there is an increase in students' critical thinking skills in general. As seen in the uncritical category, from the pre-test there were still 1.92%, so there were no more students who were categorized as uncritical when the post-test was carried out. Likewise in the quite critical category, which previously had a percentage of 34.62% to only 1.92%. This means that the percentage in the moderately critical category has decreased, which indicates that the use of e-modules can improve students' critical thinking skills. In fact, there was a significant increase in the critical category, originally at 63.46% to 94.23%, which means that most students have met the criteria for critical thinking when participating in learning by utilizing e-modules.

For the very critical category, in the implementation of the pre-test there were no students who reached this category, but when the post-test was carried out it was found that 3.85% of students reached the very critical category. This condition is a significant finding, considering that critical thinking skills are needed by everyone in order to determine relevant and appropriate actions. After examining the increase in the percentage of students' critical thinking skills in each category, the increase can also be seen from the average score of the tests carried out. To clearly understand the average score of the critical thinking skills test that was held, it can be seen in Figure 2.

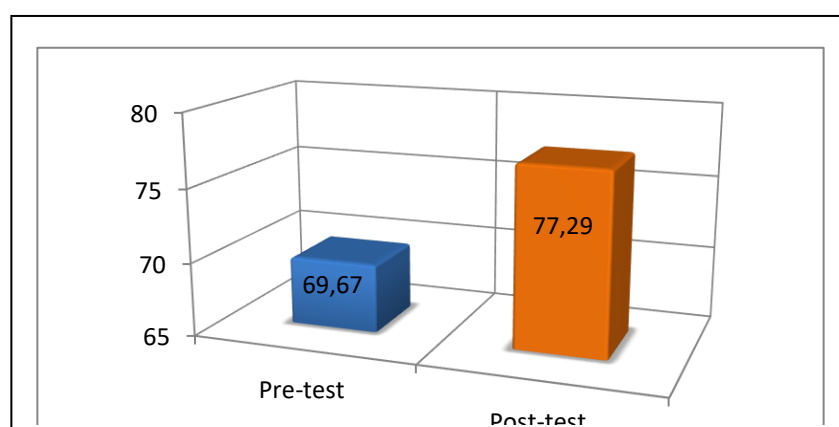


Figure 2. Comparison of Pre-test with Post-test

Examining the information presented in Figure 2, it is clear that there has been an increase in the average value of students' critical thinking skills after utilizing e-modules in learning. When the pre-test was carried out, the average score of the students was 69.67; then the e-module is used in learning which is then

carried out again, namely the post-test and the average value of students' critical thinking skills is 77.29. That is, in the learning process by utilizing e-modules there is an increase in students' critical thinking skills of 7.62. This increase indicates that the e-module is effectively used in order to optimize students' critical thinking skills. To ensure that the e-module is effectively used in learning to optimize students' critical thinking skills, statistical tests are carried out. The results of the tests carried out in [Table 8](#).

Table 8. Student Critical Thinking Skills Test Results

Number	Testing	t	Signifikansi	Description
1	Small Group	14.355	0.001	Effective
2	Field Test	22.785	0.001	Effective

Making sense of the results of the analysis presented in table 8, it can be seen that the tcount value in the small group test obtained a value of 14.355 with a significance of 0.001 which means it is smaller than 0.05, because of that in the small group test it was stated that the e-module developed was effective for learning. Moreover, it is understood that effectiveness means that the learning e-module is able to optimize students' critical thinking skills. As for testing using more respondents or known as field tests, a tcount value of 22.785 is obtained with a significance of 0.001. The achievement of these values confirms that the learning e-module developed in this study has proven to be effectively used in learning to optimize students' critical thinking skills. Therefore, this e-module can be used as an alternative learning material so as to provide greater opportunities for optimal student critical thinking skills.

Discussion

The development of social learning e-modules is carried out in accordance with the stages of development research starting from planning, development and evaluation. At the planning stage, a needs analysis and an analysis of the initial conditions of the students' critical thinking skills are carried out. Henceforth, the development process is carried out by first identifying the learning objectives until finally compiling the material in the form of an e-module. After the e-module prototype is produced, its validity is tested through expert review. From the results of the validation it was stated that the e-module prototype was valid for use in learning. The testing phase was continued through one-to-one and small group tests, which resulted in information that the developed e-modules were declared practical for use in the implementation of learning. This means that the social learning e-modules developed by researchers are proven to be valid and practical to use in learning. Further testing is carried out to ensure the effectiveness of using e-modules in order to optimize students' critical thinking skills.

The results achieved prove that social learning e-modules are proven to be effective in optimizing students' critical thinking skills. The results of this study also support and confirm that e-modules can effectively optimize learning outcomes ([Jamaluddin & Nisa', 2019](#); [Nisa et al., 2020](#); [Wijaya & Vidiанти, 2019](#)). As in this study, the results obtained were that students' critical thinking skills could be optimized through the use of social studies learning e-modules, just as social studies learning is required as one of the comprehensive social learning, because in it there is social life which should have attitudes and thinking skills. Critical, even acting critically when facing various forms of social problems ([Fitria et al., 2020](#); [Tapung et al., 2018](#)). As it is known that e-modules are a hybrid or blended form of learning, because the implementation of learning can also be carried out by students anywhere, of course, when connected to an internet network. As part of blended learning according to the characteristics of the e-module, namely learning independence, the achievement of increased learning outcomes is also one of the goals of the learning process that has proven results ([Nuryani et al., 2022](#); [Wulandari et al., 2020](#); [Zimba et al., 2021](#)).

The results achieved in this study also support previous findings which state that critical thinking skills can be built properly through learning that utilizes e-modules ([Rahmat et al., 2020](#); [Sugiharti et al., 2019](#)). It has also been proven that e-modules based on problem learning can improve students' critical thinking skills and have been proven in real terms in testing hypotheses ([Rokhmania & Kustijono, 2017](#); [Seruni et al., 2020](#); [Wahyuni et al., 2020](#)). E-modules are essentially alternative learning materials for students, which if used properly can certainly optimize their potential as well as improve critical thinking skills ([Nikita et al., 2018](#); [Sulistiani et al., 2022](#)). As it is understood that e-modules are a form of integration of learning that utilizes technology in the process, so of course the results achieved from this integration will result in more comprehensive learning ([Fahmi et al., 2021](#)). Considering that the e-module developed in social learning already contains various test questions, so the thought process can be repeated if you still don't understand the context. This is in line with the statement that e-modules which contain online tests can help improve learning outcomes ([Lestari & Parmiti, 2020](#)). Therefore, it is fitting for e-modules to be put to good use by every educator. Not only

in social learning, e-modules should also be developed for other learning so that the quality of learning becomes better and the implications for the quality of education become more optimal in the future.

4. CONCLUSION

Examining the various research findings, as well as the discussions that have been carried out related to these findings, it is concluded that the developed social learning e-modules have been tested as valid or suitable for use in learning, practically used as digital-based learning materials. Likewise, it is also proven that social learning e-modules are proven to be effective in optimizing students' critical thinking skills.

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