

## The Development of Interactive and Innovative E-Modules Based on Life Skills to Improve Student Learning Outcomes

Iffah Nafia<sup>1</sup>, Nurul Umamah<sup>2</sup>, Marjono<sup>3</sup>

<sup>1,2,3</sup> Department of History Education, Faculty of Teacher Training and Education, University of Jember, Indonesia

ORCID ID : <sup>2</sup>0000-0002-3589-5014

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**ABSTRACT:** This research is development research which aims to determine the effectiveness of using e-modules as products that have been developed. Innovation in the form of interactive and innovative e-modules based on life skills is urgently needed considering the development of science and technology and the currents of globalization which have an impact on the field of education, as well as student involvement in active learning, improving skills and being able to solve problems is really needed. This study uses the ADDIE model. Data collection was carried out by means of observation, questionnaires, and interviews. The research samples were three SMA for observation and one school for trials with 32 students. The validation results from the development of interactive and innovative electronic modules show that the electronic modules have met the validation standards of material experts of 96.3% with very good qualifications, validation of linguists reached a percentage of 94% with very good qualifications and validation of design experts reached a percentage of 89% with very good qualifications, and 88% individual user test with very good qualifications. Based on learning outcomes using interactive and innovative e-modules based on life skills can be used as learning resources in schools for students. Evidenced by an increase in student learning outcomes through small group trials using an effectiveness test formula of 80% with high qualifications, and large group trials of 0.78% with high qualifications. Based on these results, it can be concluded that there is an increase in student learning outcomes after using interactive and innovative e-modules based on life skills as a learning resource.

**KEYWORDS:** Development, E-Module, Interactive, Innovative, Life Skills, Learning Outcomes

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### INTRODUCTION

The current development of digital technology has indirectly encouraged the use of technology in education which is important to do. The latest technology is used to help expand learning content and increase student learning efficiency (Taufik, et al., 2018; Wai, et al, 2018; Hew, et al., 2018). Technology integration in learning must be carried out with the hope of encouraging students to learn not only the skills and knowledge needed but also to identify sources to learn skills and knowledge simultaneously. Technological developments bring challenges as well as opportunities for the world of education. To answer these challenges, learning is carried out in order to prepare students to have 4C skills including: 1) critical thinking and problem solving, 2) creativity, 3) collaboration, and 4) communication (Khoirunnisa et al, 2019; Umamah et al., 2020; Sumardi, et al., 2020). These skills or skills are needed by students to think innovatively, creatively and interactively in learning and everyday life as a provision for the future.

Students are asked to be fully involved in the learning process so that they can welcome challenges and enjoy an interactive learning environment (Anaelka, 2018). On the other hand, conventional learning models by making educators the center of learning activities are no longer relevant to their development (Giunta, 2017; Permana et al., 2018) Easy access to information via the internet has replaced books and as part of information sources (Umamah et al. , 2016). So that it causes challenges in the form of changes to special learning content such as platforms that are friendly for students or learners (Adedoyin & Soykan, 2020). Interactive relationships and the use of technology are learning processes that build and empower students to increase individual responsibility for the information, so that students become more active, motivated, and able to study knowledge independently (Rufaidah et al., 2021). Thus indirectly requiring educators to design strategies to create a comfortable learning environment, as well as compatible learning resources to make learning interactive and innovative.

Interactive learning is considered relevant to its use because students as subjects in learning are the millennial generation who are familiar with the use of technology which does not make them easily bored during the learning process (Li et al., 2018; Sahronih et al., 2019). The learning environment includes knowledge that is relevant and applicable to students thereby increasing intrinsic motivation and learning outcomes (Li et al., 2018). Innovative learning actualization aims at new strategies and methods with varied characteristics but aimed at a better learning experience (Umamah et al., 2020). Innovative learning has clear

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implications and can improve strategies for educators themselves and learning strategies for students (Purwadhi, 2019). Interactive and innovative are not enough if they are not matched with life skills-based education which is an effective strategy for dealing with 21st-century competition (Murphy-Graham & Cohen, 2022; Wetchasit et al., 2020). Life skills are defined as individual abilities to adapt positively to all kinds of life demands and challenges (Mislaini, 2017; Umamah et al., 2020). In addition, life skills are associated with the dynamics and complexity of life, thereby providing significant value for both education and society (Umamah et al., 2020). So with the life skills possessed, they can think and act in an adult, critical, and ethical manner in responding to life, and still survive during the times.

Problems related to learning content are very complex, especially in learning history. In this case. Historical learning is described as only providing a set of information about certain historical periods or eras that are less interesting to teach students (Fatih et al., 2018). This is certainly different from the objectives of learning history, namely students must need an understanding of themselves, society and the formation of the Indonesian nation through a long history and are still in process until now and in the future. In addition, educators as learning facilitators are challenged to be able to develop relationships between various theories and methods or learning models; have skills in conveying learning material that is fun and easily understood by students; able to design learning experiences and learning theories to help the development of students; as well as being able to develop teaching materials and provide good educational practices (Lévesque & Zanzanian, 2015; McCullocha, 2016; Safitri et al., 2019; Umamah et al., 2017). The problems in outline have a big influence on the implementation and results of the learning process that will be obtained by students later.

Based on the results of performance analysis for educators, the problems found in history learning in the 3 schools are: (1) 66% of educators experience problems in teaching history in the form of materials, (2) 0% of educators develop materials in the form of teaching materials, (3) 100% Educators experience problems conveying material due to a lack of primary sources, (4) 66% of Educators stated that the material in the textbooks was not in accordance with KI/KD, (5) 56% of Educators stated that the depth of the material in the textbooks was not in-depth, (6) 50% Educators experienced obstacles in using certain learning media, (7) 47% of educators experience problems in using certain learning models. The results of this analysis prove that educators have not been able to convey learning material maximally because they are hampered by a lack of learning resources and supporting media.

Based on performance analysis on students, the problems found in history learning in the 3 schools were: (1) 62% of students had difficulty remembering history learning material, (2) 78% of students had difficulty explaining history learning material again, (3) 86 % of students stated that they had problems understanding learning material because educators only used textbooks and LKPD as teaching materials, (4) 69% of students stated that the learning methods used by educators were less innovative, (6) 55% of students stated that the learning media used educators provide less stimulus, (7) 50% of students state that the learning model is monotonous and less fun. The results of this analysis prove that it is difficult for students to accept and understand the material because they are hampered by inadequate learning resources.

Based on the results of the resource analysis stage, it can be seen some information regarding existing teaching materials, and the need for teaching materials required by Indonesian history subjects for class XI, it can be concluded that the obstacles faced by students related to teaching materials are: (1) 60% of materials teaching materials are still conventional/not yet integrated with technology, (2) 56% of teaching materials use language that is less communicative, (3) 54%% of teaching materials are less motivating, (4) 82% of teaching materials are incomplete in terms of material, (5) 51% teaching materials are boring, (6) 47% of teaching materials are monotonous (6) 50% of teaching materials only provide material and a few pictures, (7) 60% of teaching materials do not provide audio, (8) 66% of teaching materials do not provide videos, ( 9) 80% of teaching materials do not help self-study. The results of this analysis prove that the existing teaching materials are less supportive because the content is monotonous and less attractive to users.

Based on the results of the analysis of characteristics on point attitude, it can be concluded that students showed an attitude, namely: (1) 11% of students stated that learning history was very interesting to learn, (2) 13% of students stated that learning history was interesting to study, (3) 36% of participants students stated that learning history was quite interesting to learn, and (4) 40% of students stated that learning was not interesting to learn. This proves that learning history is considered boring to learn because students do not have an interest, or motivation in learning history.

Based on the explanation of the problems above which are very complex, the developer chooses a problem-solving solution in learning history by developing technology-integrated teaching materials, namely electronic modules as the best solution to keep up with changes in digital transformation and educational needs. The e-module is deemed appropriate based on the results of the needs analysis that has been carried out because it can fulfill the achievement of 4C Skills, and increase interest, motivation, and learning outcomes expected by educators and students. The Electronic Module, which is packed with interactive

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and innovative applications, can provide convenience for students via gadgets or smartphones to achieve learning goals. The Electronic Module is also directed towards life skills-based, because life skills are appropriate to be implemented in learning because they are proven to be able to overcome various problems and improve skills and independence to make it easier to face future challenges (Nasheeda et al., 2019; Mulyadi et al., 2020; Umamah et al. ., 2020). Research conducted by (Bancin & Ambarita, 2020) states that Life Skills can improve learning outcomes. This adds to the need for the importance of interactive and innovative e-modules based on life skills that need to be developed to improve student learning outcomes.

### METHOD

This research is a type of development research using the ADDIE model. The ADDIE development model has 5 main stages including Analyze, Design, Develop, Implement, and Evaluate (Branch, 2009). This development model can be used for various forms of product development such as learning models, learning methods, learning strategies, learning media, and learning resources or teaching materials. The subjects of this study consisted of 1 history educator and 32 students. The data analysis technique used is qualitative and quantitative analysis techniques. Qualitative data analysis was obtained from observations, questionnaires, expert advice, and documentation at school. Meanwhile, quantitative data analysis is used to define the quality of interactive and innovative e-modules based on life skills developed according to the validation of experts and users, as well as the learning outcomes of students after using e-modules as learning resources. The validity test is calculated using the help of the IBM V.23 for Windows Statistical Product and Service Solutions (SPSS) software program to determine whether there is a difference or not from the results of student learning effectiveness before and after using interactive and innovative E-modules based on life skills, with the formula as follows.

$$P = \frac{\sum X}{\sum Xi} \times 100\%$$

Information :

P : Presentase

$\sum X$  : Total score of respondents answers

$\sum Xi$  : Total ideal value in 1 item

(Cohen, Manion, & Morrison, 2018)

The results of calculating the percentage of the questionnaire will be analyzed through product eligibility criteria. The following table 1 product eligibility criteria.

**Table 1 . product eligibility criteria**

Average score	Classification	Conclusion
85%-100%	very good	no need for revsion
75%-84%	good	no need for revision
65%-74%	fairly good	revision
55%-64%	not good	revision
0-54%	very poor	revision

Source: Cohen, Manion, & Morrison (2018)

The results of the mean pre-test and post-test scores of students during small group trials and large group trials using the interactive e-module draft that has been developed will be used to measure the level of effectiveness of learning history using the effectiveness formula. The increase in student learning outcomes is known from the results of the pre-test and post-test which are calculated using the effectiveness formula. Data on improving student learning outcomes data is calculated using the formula below:

$$\text{N-gain} = \frac{(\text{Score post test} - \text{Score pre test})}{(\text{Score maksimum Ideal} - \text{Score pre test})}$$

Information:

g = Normalized gain value

The results of the N-gain calculation will be analyzed using the N-gain criteria. The following is table 2 of the N-gain criteria.

**Table 2 . N-gain criteria**

Normalized gain range	Criteria
$< g > < 0,30$	Low
$0,70 > < g > \geq 0,30$	Medium
$< g > \geq 0,70$	High

Source: Cohen, Manion, & Morrison (2018)

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## RESULT AND DISCUSSION

### E-Module Draft Development Process

The process of developing interactive and innovative life skills-based electronic modules using the development ADDIE model (Branch, 2009). The steps taken in the development research are described in the following table.

**Table 3 . Development Steps**

<b>Steps</b>	<b>Description</b>
<b>Analyze</b>	Researchers perform analysis; Validating performance gaps, defining instructional objectives, needs analysis students, resources needed, recommend potential submissions system, in three different schools to find out what history learning needs are needed to improve the learning process.
<b>Design</b>	The goal of the design phase is to verify the desired performance by suitable test methods. At this step a design is needed to achieve the desired learning objectives. The activity in this stage is to design teaching materials in the form of life skills-based digital modules so that a prototype of the product to be developed is obtained.
<b>Development</b>	The purpose of this stage is to generate and validate the selected learning resources. In this phase, creating and modifying teaching materials that will be used in the learning process and also used to achieve competency demands, then you must be able to identify all the resources that will be needed before finally being validated by experts and tested on users.
<b>Implementation</b>	At this step it was carried out by testing teaching materials in the form of innovative and interactive electronic modules based on life skills directly in the field on students, in this trial process it was only carried out in 1 target school with a sample 32 students.
<b>Evaluation</b>	Evaluation is a final stage for a process carried out to provide value to product development. This evaluation stage focuses on measuring and evaluating the use of the product. Activities in this evaluation stage clarification of the competencies that must be possessed by students after using the module electronic teaching materials that have been developed.

### Validity Trial Results

#### a) Material expert validation

Data analysis contains a description of the results of the assessment carried out by an expert validator in the field of study of life skills-based e-modules. The results of this analysis are used to determine the feasibility level of the content of the material for the developed life skills-based e-module product. The results of the field of study expert validation values obtained from the results of the presentation of the field of study expert validation data are as follows.

$$P = \frac{53}{55} \times 100\% = 96,3\%$$

Based on the results of the expert's assessment of the life skills-based e-module, a percentage of 96.3% was obtained. If it is adjusted to the product feasibility qualifications, it shows that the validation results of experts in the field of study fall into the "very good" category and do not need revision.

#### b) Linguist expert validation

The data analysis contains a description of the results of the assessment conducted by the validator linguist on life span-based e-modules. The results of this analysis are used to determine the feasibility level of the content of the material for the developed e-module product. The results of the linguist validation values obtained from the results of the presentation of linguist validation data are as follows.

$$P = \frac{48}{50} \times 100\% = 94\%$$

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Based on the results of the language expert's assessment of the life skills-based e-module, a percentage of 94% was obtained. When adjusted for product eligibility qualifications, it shows that the validation results of language experts fall into the "very good" category and do not need revision.

### c) Design expert validation

The data analysis contains a description of the results of the assessment carried out by the design expert validator on the Life Skills-based e-module. The results of this analysis are used to determine the feasibility level of the content of the material for the developed e-module product. The results of the design expert validation values obtained from the results of the presentation of the design expert validation data are as follows.

$$P = \frac{49}{55} \times 100\% = 89\%$$

Based on the results of the design expert's assessment of the life skills-based e-module, a percentage of 89% was obtained. If it is adjusted to the product feasibility qualifications, it shows that the validation results of the design experts are in the "very good" category and do not need revision.

## Product Trial Results

Product development has gone through the validation process by three validation experts (material, language, and design) and has passed for trials, the next step that must be carried out is trials on educators as users of life skills-based e-module products. Test users are asked to provide responses and responses to e-module products as users in the field. This trial phase aims to determine whether the quality of the e-module can improve student learning outcomes.

### a) Educator user trials

Life skills-based interactive and innovative e-module user trials were conducted on educators as user trial subjects. Data analysis contains data from the assessment results obtained from educators as a user test of life skills-based e-module products. The results of the analysis are used to determine the feasibility level of the e-module product as follows.

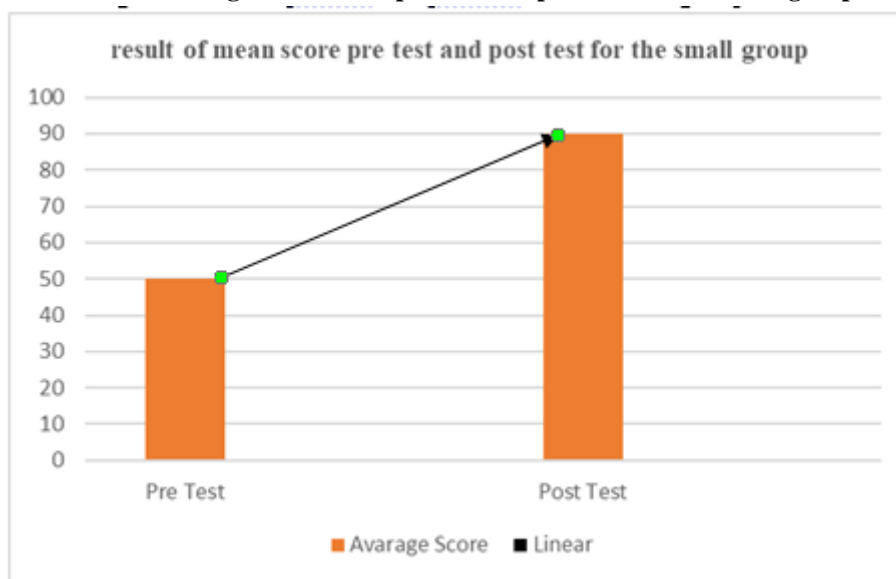
$$P = \frac{44}{50} \times 100\% = 88\%$$

Based on the results of the user test assessment of the survival skills-based e-module, a proportion of 88% was obtained. If it is adjusted to the product feasibility qualifications, it shows that the results of the test data are in the category of "very good" users and do not need to be reviewed.

### b) Student Small Group Trials

Small group trials were carried out after conducting user trials to educators. Small group trials were carried out involving 12 students using interactive and innovative e-modules based on life skills. The number of evaluation questions given consists of 20 test items multiple choice. value data pre-test and post-test are used as material to determine the effectiveness of the product in improving student learning outcomes.

**Bar Chart.1 the average score of the pre test and post test for the small group**



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**Table 4. Result paired statistic**

Value	Mean	Std. Deviation
Pre test	50,0	10,66
Post test	90,0	8,25

Based on the small group test evaluation value table above, an average pre-test score of 48.0 was obtained and a post-test value of 90.0. The average value of the post-test is greater than the value of the pre-test. Thus it can be concluded that there was an increase in student learning outcomes in small group trials before and after using life skills-based e-modules.

**Table 5. Test results paired correlation**

Total N	Correlation	Value Sig
12	0,413	0,182

Table 5 shows a significance level of 0,413 (greater than the threshold value = 0.05). Thus, there is no significant correlation between the pre-test and post-test scores in the small group at the 5% confidence level ( $0.39 > 0.05$ ).

**Table 6. Test results paired correlation**

Value t	Df	Value Sig
13,26	11	0.00

Based on table 6 it is known that the t test value is 13.26 (df = 11) and a significance value of 0.00. This significance value is lower than the 5% confidence level threshold value ( $0.00 < 0.05$ ). Thus it can be concluded that there is a significant difference between the Pre Test and Post Test scores in the small group subjects.

Based on the results of the average pretest and posttest scores in small group trials that have been carried out by 12 students, then testing the effectiveness of the use of interactive and innovative e-modules based on life skills is calculated using the following this formula

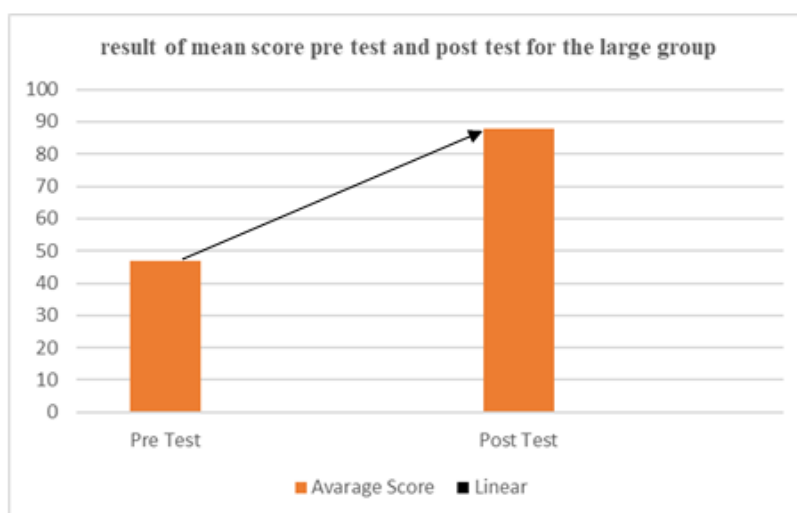
$$\text{N-gain} = \frac{(1080 - 575)}{(1200 - 575)} = \frac{505}{625} = \mathbf{0,80}$$

Based on the results of the assessment using the formula above, it can be concluded that the level of effectiveness of the product developed in the small group trial is 0.80%. If it is included in the N-Gain criteria table, then the product being developed is included in the high qualification for its effectiveness. So life skills-based e-modules are effective for improving student learning outcomes

### c) Student Large Group Trials

Large group trials were carried out involving 32 students using innovative and interactive e-modules based on life skills. The number of evaluation questions given consists of 20 multiple-choice test items. The pre-test and post-test value data are used as material to determine the effectiveness of the product in improving student learning outcomes. The following is the presentation of pre-test and post-test evaluation value data in field trials.

**Bar Chart.2 the average score of the pre test and post test for the large group**



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**Table 7. Result paired statistic**

Value	Mean	Std. Deviation
Pre test	47,9	14,91
Post test	88,2	9,21

Based on the table of field test evaluation values above, the average pre-test value was 47.2 and the post-test value was 88.2. The post-test average value was greater than the pre-test value. Thus it can be concluded that there was an increase in student learning outcomes in field trials before and after using life skills-based e-modules.

**Table 8. Test results paired correlation**

Total N	Correlation	Value Sig
32	0,590	0,00

Table 8 shows a significance level of 0,00 (greater than the threshold value = 0.05). Thus, there is no significant correlation between the pre-test and post-test scores in the small group at the 5% confidence level ( $0.39 > 0.05$ ).

**Table 9. Test results paired correlation**

Value t	Df	Value Sig
18,93	31	0.00

Based on table 9 it is known that the t test value is 18,93 (df = 31) and a significance value of 0.00. This significance value is lower than the 5% confidence level threshold value ( $0.00 < 0.05$ ). Thus it can be concluded that there is a significant difference between the Pre Test and Post Test scores in the small group subjects

Based on the results of the average pretest and posttest scores in large group trials that have been carried out by 32 students, then testing the effectiveness of the use of interactive and innovative e-modules based on life skills is calculated using the following this formula.

$$N\text{-gain} = \frac{(2825 - 1510)}{(3200 - 1510)} = \frac{1325}{1690} = \mathbf{0,78}$$

Based on the results of the assessment using the formula above, it can be concluded that the level of effectiveness of the product developed in field trials is 0.78%. If it is included in the N-Gain criteria table, then the product being developed is included in the high qualification for its effectiveness. So life skills-based e-modules are effective for improving student learning outcomes.

The findings of this study are reinforced by the analysis of the problems that have been carried out in the three schools aimed at identifying and defining the basic problems encountered in learning history, so it is necessary to develop innovative interactive electronic modules based on life skills because the teaching materials used are mostly conventional in schools. Development of e-learning interactive and innovative modules based on life skills can be a new thing designed to be able to solve the main problems that exist in schools, especially history learning. Basically e-modules are appropriate and effective teaching materials used as historical learning resources (Ma'rifatullah et al., 2021), because they can facilitate students in the learning process and make it easier for teachers to teach (Sopacua, et al., 2020; Hamid, et al., 2020), helps improve the quality of education of students (Umamah, et al., 2020). on the other hand, having Life skills can make students adapt to all kinds of life demands, challenges can improve psychosocial well-being, communication skills, positive thinking (Umamah et al., 2020; Mislaini, 2017). Based on the results of this study, the development of interactive e-modules and innovative life skills based on history subject in class XI SMA can improve student learning outcomes with the support of relevant previous research. Previous journals entitled "Developing Interactive Modules Using the Learning Content Development System (LCDS) to Improve Student Learning Outcomes with 4D" and "Developing Interactive Electronic Module Teaching Materials" stated that interactive e-modules can improve student learning outcomes (Sugiarto, Umamah, Sumardi, 2019; Wijaya & Vidianti, 2020). Previous research entitled "Development of Life Skills-Based Learning Modules" stated that life skills-based e-modules can improve student learning outcomes (Nurbaiti, 2019). Previous research entitled "Life Skills-Based Modules in Mathematics Lessons" also stated that it could improve student learning outcomes (Rulyansah and Sholihati, 2018). Based on various studies it is proven that Life Skills can improve skills, independence, competence and competence in various ways (Bancin & Ambarita, 2020; Jaya et al., 2018; Mailin, 2021). The results of research conducted by the developer are relevant to previous research, including research from Ma'rifatullah, Umamah, Marjono, Sumardi & Surya (2021) showing the results of e-module development show expert validation to get a score that meets the requirements and is categorized as very high. Research by Imansari, Umamah, & Nai'im (2019) also

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shows the results of validating teaching materials from the three validators with an average validation result of 4.06 on a scale of 5 and is feasible to use.

### CONCLUSION

Based on the results of expert validation, product trials, and improving student learning outcomes through life skills-based e-modules, it can be concluded that life skills-based interactive and innovative e-modules have been validated by experts. The results of the content experts in the field of study reached a percentage of 96.3% with very good qualifications, the validation of linguists reached a percentage of 94% with very good qualifications and the validation of design experts reached a percentage of 89% with very good qualifications. This means that the e-module product is feasible to be used or tested.

Based on the user trial stage, a percentage of 88% was obtained with very good qualifications. The results of product trials involving small group trials involving 12 students showed a pre-test score of 48.0 and a post-test of 90.0. The average value of the post-test is greater than the value of the pre-test. The success of developing Life Skills-based E-modules in improving student learning outcomes can be seen from the percentage in the small group trial, which shows an increase in student learning outcomes of 0.80% with a "high" qualification. So it was concluded that there was an increase in student learning outcomes in small groups after using life skills-based e-modules. In the field trials involving 32 students, the average pre-test score was 47.1 and the post-test was 88.2. The average value of the post-test is greater than the value of the pre-test. The success of developing Life Skills-based E-modules in improving student learning outcomes can be seen from the percentage in the field trial trials, an increase in learning outcomes of 0.78% with the "high" qualification. So it was concluded that there was an increase in student learning outcomes in field trials after using the Life Skills-based e-module.

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