

## DEVELOPING A WEB-BASED E-MODULE TO IMPROVE CIVICS LEARNING OUTCOMES FOR STUDENTS AT METHODIST SENIOR HIGH SCHOOL IN BERASTAGI

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### ARTICLE HISTORY

**Received : 28-07-2026**

**Revised : 17-08-2026**

**Accepted : 30-08-2026**

### KEYWORDS

*Web-based e-modules,  
Problem-Based  
Learning,  
Bhinneka Tunggal Ika.*

### ABSTRACT

This research and development study aimed to determine the feasibility, practicality, and effectiveness of a web-based e-module learning medium covering the Bhinneka Tunggal Ika (Unity in Diversity) topic for Grade XI students at Methodist Berastagi Private High School. The study employed the Research and Development (R&D) method based on the ADDIE model, comprising five stages: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. The results indicated the following: (1) The web-based e-module was deemed highly feasible for use based on assessments by subject matter, media, and instructional design experts, achieving an average score of 93% (subject matter expert: 89%, highly feasible; media expert: 100%, highly feasible; instructional design expert: 90%, highly feasible). (2) The web-based e-module was considered highly practical, with teacher assessments yielding 94.79% and student assessments 96.30%, both falling into the "highly practical" category. (3) The web-based e-module was effective in improving student learning outcomes; the experimental class achieved an average score of 89.9, surpassing the control class's average of 83.8. Thus, it can be concluded that the developed web-based e-module on Bhinneka Tunggal Ika meets the criteria for feasibility, practicality, and effectiveness as a learning medium to enhance the Civics (Pendidikan Pancasila) learning outcomes of Grade XI students at Methodist Berastagi High School

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### INTRODUCTION

Education is a conscious and planned process to guide, develop, and shape human potential to become individuals with knowledge, character, and the ability to adapt to the social environment and changing times. Education serves not only as a means of transferring knowledge but also as an effort to build values, attitudes, skills, and a holistic personality. In other

words, education is a systematic effort to prepare students to live independently, responsibly, and contribute to society (John, 2023). This is in line with the opinion of expert Abdurrahman Saleh Abdullah, who defines education as the process of guiding a new generation towards the advancement of civilization through specific means according to their highest abilities and potential. This education is implemented and developed by society to achieve specific goals. Fostering the younger generation as subjects of education is key to achieving a better life in the future (Ardiansyah et al., 2024).

Abdurrahman Saleh Abdullah's opinion above emphasizes that education must be developed and adapted to current developments because it can produce a young generation ready for real life. School is a place for students to receive lessons from teachers, lessons delivered pedagogically and didactically. The goal is to prepare students according to their individual talents and abilities so they can stand alone in society (Battistoni, 2012). As a strategic location for achieving educational goals, every school must strive to improve the quality of education. These improvements aim to enhance both the curriculum and teacher competencies. These improvements significantly support the achievement of higher education quality. The increasing development of information technology demands the ability to survive in a competitive environment, forcing everyone to truly prepare themselves (Qondias et al., 2025a).

In practice, Pancasila and Citizenship Education (PPKn) instruction, particularly the *Bhinneka Tunggal Ika* (Unity in Diversity) subject, still faces significant obstacles in implementing the new paradigm. PPKn's mission to build national character through the values of diversity is often hampered by the presentation of material that is textual, abstract, and lacking in applicability. Teachers still predominantly use lecture methods and limited access to printed teaching materials, resulting in passive learning and a lack of engagement with students' affective and psychomotor skills. This situation not only diminishes interest but also results in shallow conceptual understanding and difficulty internalizing the philosophical values of diversity. Empirical observations show limited access to textbooks, a lack of digital learning resources, and a lack of linking the material to students' actual social realities, such as issues of intolerance, hate speech in the media, or the dynamics of multicultural societies (Arinda et al., 2025).

Based on observations by researchers at Methodist High School, Pancasila and Citizenship Education (PPKn) learning still faces serious challenges due to limited reference resources. One major issue identified is the limited availability of printed textbooks, with only one book per desk shared by several students. This situation makes it difficult for students to access materials independently, slows down the learning process, and reduces the effectiveness of learning. As a result, students tend to be passive and rely solely on teacher explanations, without having the opportunity to deepen their understanding of civic values independently (Qondias et al., 2025b).

This limited learning resource directly impacts the low quality of PPKn learning, particularly in understanding key concepts such as the rights and obligations of citizens, Pancasila values, and democratic principles. Without adequate access to learning materials, students struggle to connect the material to their surrounding social realities. Therefore, efforts are needed by schools and teachers to enrich learning resources, whether through the provision of additional textbooks, the use of digital media, or the development of contextual teaching materials. With the support of adequate learning resources, PPKn learning can be more interactive, reflective, and meaningful for students (Pangestu et al., 2024).

Based on the observations and observations conducted by researchers, improving the quality of learning can be achieved by developing learning variables. The variable directly related to learning is high-quality textbooks or textbooks. However, the availability of textbooks is still severely limited. As a result, students struggle to utilize books, which should be a learning resource. This learning situation can make it difficult to achieve optimal learning objectives.

Learning media, which serve as sources of information and knowledge, such as textbooks, magazines, newspapers, and blackboards at school, can lead to boredom in learning. Meanwhile, audio and visual media such as television, radio, and video, as well as electronic media such as computers, have not been optimally utilized. In today's technologically advanced era, learning resources can be utilized using digital literacy models, or what can be called e-learning. Therefore, teachers are challenged to utilize these digital-based learning resources. One way to achieve this is by creating teaching materials that can

be used independently and easily accessed by students in electronic format. Modules can be developed as a form of teaching material because they possess five key characteristics that make them superior: self-instructional (facilitating independent learning), self-contained (containing all material), stand-alone (not dependent on other teaching materials), adaptive, and user-friendly (easy to use). To adapt to the changing era of modules, they are created electronically for greater practicality and efficiency.

Learning media in the form of web-based e-modules can provide a learning experience that is systematically planned and designed to achieve learning objectives. The benefits of using web-based e-modules as learning resources in the learning process include expanding and enhancing the scope of classroom content, stimulating thinking, behavior, and further development. The material developed in the modules is enriching. Students can broaden their horizons by studying additional materials presented in the modules. Games are provided to prevent boredom, and key phrases are used to enhance students' self-confidence. This, in turn, motivates students' independent learning and can stimulate their creativity.

## METHOD

This research is a type of research and development (R&D). According to Sugiyono (2020), research and development is a research method used to produce a specific product and test its effectiveness. Seals and Richey define research and development as a systematic study of the design, development, and evaluation of learning programs, processes, and products that must comply with the criteria of validity, practicality, and effectiveness (Ilhami et al., 2024).

This research was conducted at Berastagi Methodist Private High School located at Gundaling I, Berastagi District, Karo Regency, North Sumatra Province 22156. This research is planned to be carried out in the even semester of the 2025/2026 academic year. The subjects in this study were 11th grade students of Methodist Berastagi Private High School, consisting of 4 classes with a total of 160 students. From all the subjects, it was determined to see the effectiveness of the product developed, the researcher only took 2 classes, namely XI Damai Sejahtera as a control class with 40 students and class XI Kasih as a treatment class with 40 students using random sampling techniques.

Researchers conducted research and development of web-based E-modules on the learning outcomes of class XI students of SMA Methodist Berastagi. The level of effectiveness of web-based E-modules to improve the learning outcomes of class XI students of SMA Methodist Berastagi through validation by material experts, validation by media experts, validation by teachers and trial use by students. The main objective of development research is not to formulate or test a theory but to develop effective products that can be used in the learning process.

Prior to wide-scale implementation, this research will undergo a series of trials, including: individual trials involving five students; small group trials involving ten students; and field trials involving 40 students in the experimental class. Furthermore, effectiveness testing will be conducted involving 40 students in the experimental and control classes. Other research subjects will include Civics teachers using the web-based e-module learning media, as well as a team of validation experts tasked with testing the feasibility of the developed learning media. The research subjects are shown in the following table:

**Tabel 1. 1 Sampel Penelitian**

| Group / Class            | Number of Samples | Class                           |
|--------------------------|-------------------|---------------------------------|
| Class XI Kasih           | 5 students        | Individual trial class          |
|                          | 10 students       | Small group trial               |
| Class XI Damai Sejahtera | 40 students       | Effectiveness test              |
|                          | 40 students       | Field test / effectiveness test |

The data collection technique used in the Web-Based E-Module development research is an assessment instrument for the product being developed. The assessment of the product consists of observation, interviews, questionnaires/assessment scales, and learning outcome tests.

### A. Observation

Observation is the activity of carefully and systematically observing an object or phenomenon to collect relevant data and information, both for research purposes and for deeper understanding, using the five senses and accurate recording techniques. In this case, systematic observation of a variable will be conducted to collect relevant data. This will allow the researcher to understand the initial conditions in the field, which will be useful for obtaining the necessary information that will be used to develop this research. Observation here is intended to identify learning needs in Civics (PPKn) learning.

#### B. Interviews

An interview is a data collection technique through structured or unstructured conversations between two or more parties, namely the interviewer and the informant, to obtain information, data, or opinions. This technique allows for in-depth information digging directly from the source, namely the respondent.

#### C. Questionnaires/Assessment Scales

Questions and assessment scales are instruments for collecting data. A questionnaire is a list of written questions or statements, and a rating scale is the categories used in the questionnaire (linkert scale) to measure respondents' level of agreement, attitude, or opinion regarding these items, which then generates quantitative and qualitative data. This data collection technique was used to obtain validation results for the web-based e-module from a team of experts (lecturers) regarding the practicality and feasibility of the media, materials, and design, as well as student responses after implementing learning using the web-based e-module on the Bhinneka Tunggal Ika topic.

#### D. Learning Outcome Tests

Learning outcome tests are evaluation tools to measure students' mastery of the subject matter and their learning progress after going through the teaching process. This instrument is crucial in collecting research data, particularly in the field of education. This test is used to assess the effectiveness of learning media in improving student learning outcomes by comparing final test scores with those from the web-based e-module and without the web-based e-module. The learning outcome test used was a multiple-choice test consisting of 40 validated items covering the cognitive domains C1 (remembering), C2 (understanding), C3 (application), C4 (analysis), C5 (evaluation), and C6 (creating). Each correct answer was given a score of 1 and each incorrect answer was given a score of 0 (zero).

Quantitative descriptive analysis is the method used for data analysis in this study concerning the development of web-based e-module learning media. Data were collected through an analytical questionnaire using descriptive statistical techniques, which were then grouped quantitatively to clarify the assessment and draw conclusions. Before using the test instrument for Civics (PPKn) to collect research data, validity and reliability tests were first conducted. The pilot test was conducted on respondents outside the sample. This method involved administering the test to students selected as pilot test respondents. This study focused on learning outcomes in the PPKn subject for 11th-grade students at SMA Methodist Berastagi.

Descriptive statistical analysis was used to assess the validity of the learning modules based on the average scores of the web-based e-modules validated by a team of experts and revised based on the corrections and suggestions of the expert team (Sriadhi, 2018). The practicality of web-based learning e-modules can be assessed by examining their implementation in learning activities and student and teacher responses to them. This practicality was obtained through questionnaire data from students and teachers after the implementation and participation of the learning process using the developed web-based learning e-modules. The effectiveness of web-based e-modules can be assessed based on students' learning abilities, student activities, and teachers' ability to manage learning. This effectiveness is derived from data from the classical completion analysis of student learning outcome tests, observations of student activities, and observations of teachers' ability to manage learning using the developed web-based e-modules.

## RESULT AND DISCUSSION

Problem analysis is carried out to obtain information regarding problems in Civics learning. Especially in the Bhinneka Tunggal Ika material. Problem analysis was carried out through interviews with two PPKn teachers at Berastagi Methodist Private High School, it was found that teachers lacked creativity in using information technology and the internet,



limited learning media, especially books, so that students had difficulty understanding the learning material. The results of this problem analysis are the basis for developing PPKn learning media (Kusumawati et al., 2025).

Based on the results of a questionnaire distributed to Civics and Citizenship Education (PPKn) teachers, the following results were obtained:

- All teachers (100%) stated that the teaching of Bhinneka Tunggal Ika (Unity in Diversity) material has been running optimally, in line with expectations.
- Some teachers (50%) stated that the teaching is well-structured in terms of defining objectives, selecting models, media, teaching materials, assignments, and assessments.
- All teachers (100%) stated that they have not implemented web-based e-modules in Civics and Citizenship Education (PPKn) learning.
- All teachers (100%) stated that they are willing to use web-based e-modules in teaching Bhinneka Tunggal Ika material.
- All teachers (100%) stated that they are willing to use web-based e-modules through Problem-Based Learning to improve Civics and Citizenship Education (PPKn) learning outcomes.

Based on the results of the teacher needs analysis, it is understood that the development of web-based e-module learning media is necessary for teachers, as a means to support the Civics learning process at Methodist Berastagi Private High School, as teachers acknowledged the difficulty in finding effective learning media for delivering the Bhinneka Tunggal Ika (Unity in Diversity) material in Civics (Saputra et al., 2025; Susanto et al., 2026).

### **Curriculum Analysis**

Curriculum analysis is conducted to determine the knowledge and skills students will acquire during the learning process. Curriculum analysis involves identifying core competencies (KD) and determining achievement indicators (GPA) based on the independent curriculum, combined with a deep learning approach (meaningful and enjoyable learning). Curriculum analysis aims to identify potential opportunities for improving student learning outcomes, the media to be used, and the time allocation. The results of the curriculum analysis are used to determine learning steps in the lesson plan (RPP) and to develop test instruments (Aluf, 2026).

### **Learning Objective Analysis**

The analysis of learning objectives outlines the formulation of learning objectives based on the KD for the Bhinneka Tunggal Ika material in Civics. The results of the learning objectives are used in the RPP.

### **Student Analysis**

Student analysis examines student characteristics that align with the learning media development design. The purpose of this analysis is to obtain information about the characteristics of eleventh-grade students at Methodist Berastagi Private High School. The aspects analyzed include academic background, cognitive development, affective skills, and psychomotor skills related to the learning materials and learning media to be developed. All participants (100%) were interested in using web-based e-modules using the Problem-Based Learning method.

- Most students (90%) stated that learning Bhinneka Tunggal Ika (Unity in Diversity) has not been enjoyable.
- Most students (70%) stated that learning Bhinneka Tunggal Ika is difficult to understand and boring without digital media.
- All students (100%) own smartphones.
- All participants (100%) agreed that learning Bhinneka Tunggal Ika material should use web-based e-modules.
- All participants (100%) were interested in using web-based e-modules using the Problem-Based Learning method

After conducting a needs analysis, it was clear that developing web-based e-modules for Bhinneka Tunggal Ika material is crucial for improving student learning outcomes. Through problem-solving exercises that involve higher-order thinking, these web-based e-modules will facilitate students' understanding of Bhinneka Tunggal Ika concepts in a more

active, enjoyable, and effective manner. This is expected to improve learning outcomes throughout the learning process (Faiza et al., 2025; Prawira et al., 2025).

### Analysis of Student Characteristics

Student characteristics, including attitudes, motivation, and abilities, are also factors influencing the Bhinneka Tunggal Ika (Unity in Diversity) learning process. In this study, student characteristic analysis was conducted through discussions or interviews with homeroom and subject teachers, as well as observations of Bhinneka Tunggal Ika (Unity in Diversity) learning in the classroom. Based on the results of this analysis, it was concluded that:

- Attitudes toward Bhinneka Tunggal Ika (Unity in Diversity) learning. Discussions with homeroom and subject teachers revealed that some students showed a lack of enthusiasm for Civics (PPKn) learning. Some admitted to feeling bored with monotonous learning methods and the lack of variety in the use of learning media. This attitude likely arose from the lack of visual and interactive simulations in Civics learning.
- Learning Motivation. Student learning motivation is also affected by monotonous learning experiences. Initial diagnostic results indicate that some students may need additional encouragement to stay motivated in learning PPKn. The lack of variety in learning methods and the limited use of learning media can reduce students' interest and motivation to actively engage in the learning process.
- Prior Knowledge of Bhinneka Tunggal Ika. Limitations in the use of learning media can also impact prior knowledge of Bhinneka Tunggal Ika. Some students struggle to understand Bhinneka Tunggal Ika due to a lack of visible examples and varied and interactive learning media for presenting Bhinneka Tunggal Ika.

This electronic module (e-module) is used in this development which is designed via a website so that students and students can access it via a link. Formal selection in the development of web-based e-modules uses an interactive approach to e-modules where the creation focuses on student activities in the form of a series of learning processes from learning videos, material presentations, pictures of learning materials, cases that guide students to think to find solutions and questions that lead students to see the extent of their abilities in understanding the material that has been studied. Studying Structured Theory: Students can read and understand the history, meaning and application of the Bhinneka Tunggal Ika value independently. Analyzing Real Cases: Students can engage in discussion sessions and solve case studies related to the challenges of diversity and social conflict. Testing Understanding of Material: Students can measure the extent to which they have mastered the material by taking quizzes and interactive questions available in the evaluation menu. Doing Self-Reflection: Students can share the results of their thoughts and learning experiences, as well as exchange reflections with other users. This e-module is also equipped with a glossary so that students are able to know the meaning of difficult words. This e-module also includes a summary for students (Vika et al., 2026).

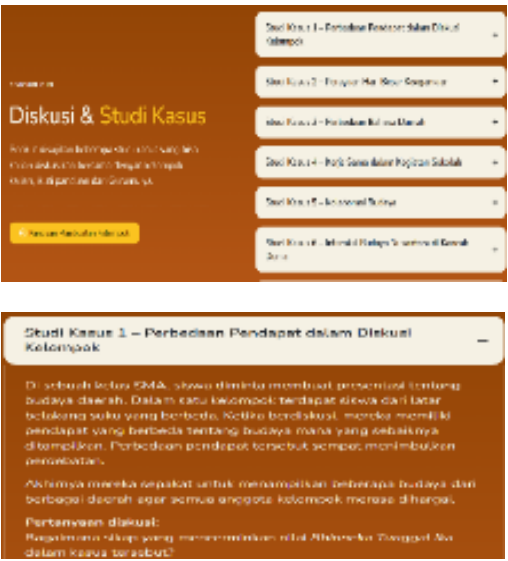
The development of this e-module product design includes the learning navigation process in the CivicHolic e-module which is initiated in a structured manner from the Landing Page which functions as the main gate for information. At the very top of the home page, students are immediately faced with the main navigation menu (Header Menu) which contains sequential links to the Home, Competency, Material, Activities, Evaluation and Reflection components. Right below the menu, there is a main section (Hero Section) which displays the large title "Bhinneka Tunggal Ika" along with a philosophical quote as the center of visual attention (focal point) (Sintania et al., 2026).

In this area, the navigation system provides two main action buttons (Call to Action) which are very intuitive, namely the "Start Learning" and "User Instructions" buttons. If students click the hint button, the system will direct them to the e-module operational technical guide. Meanwhile, the "Start Learning" button functions as an opening interaction that automatically shifts (scroll down) students' views to the Achievements & Learning Objectives section, before finally they are directed to the core material panels, discussion activities, interactive quizzes, and self-reflection pages sequentially. In the Self-Reflection section, an interactive feature is provided for students to type and share feedback about what they have learned that day. Right below the reflection space, there is final navigation to the About Us menu which provides the developer profile as well as the source of the validity of CivicHolic material. This user journey flow is formally closed by copyright information

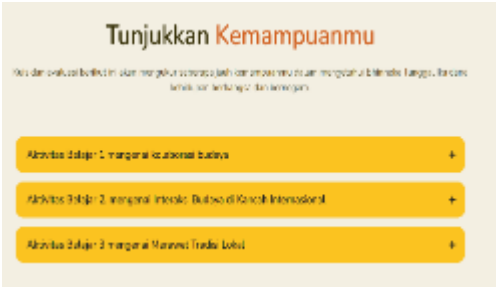
at the bottom of the footer. This navigation structure from the front end to the back end of the page ensures that students experience a complete learning cycle, from encoding information, theory application, to the metacognition stage.

**Table 2.** CivicHolic e-module

| No | Web-Based E-module Interface                                                       | PBL (Problem Based Learning) Phase |
|----|------------------------------------------------------------------------------------|------------------------------------|
| 1. |  | Opening Interface                  |

| No | Web-Based E-module Interface                                                                                          | PBL (Problem Based Learning) Phase                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. |  <p>Study and usage instructions</p> | Phase 1: Orient students to the problem, explain the necessary logistics, motivate students                                                                                                                                                                                                                                                                                                                                                                                      |
| 3. |  <p>Presented material</p>          | Phase 2: Coordinating<br>Students to learn through the provided materials                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. |                                    | <p>Phase 3</p> <p>Guide students in group investigations. Students will be asked to form groups according to the provided guidelines. Once they have formed groups, they will engage in discussions to solve the problems outlined in the e-module.</p> <p>Phase 4: Develop and present the results of their discussions.</p> <p>Help students prepare appropriate results and present them in a report. Next, help students to upload their reports to the place provided..</p> |



| No | Web-Based E-module Interface                                                                                              | PBL (Problem Based Learning) Phase                                                                                                                                                                                             |
|----|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                          |                                                                                                                                                                                                                                |
| 5. |                                         | Students will complete individual practice assignments to determine their understanding of the material. If they don't achieve the required passing grade, they will be required to retake the exam and re-study the material. |
| 6. | <p>Individual exercise activities</p>  | Phase 5:<br>Analyzing and evaluating the problem-solving process, students are asked to provide feedback on the learning they have completed.                                                                                  |

Product validation was conducted with a number of experts, including material, media, and learning design experts. This was expected to allow users to provide constructive feedback and suggestions on the strengths and weaknesses of the web-based e-module being developed, until the resulting learning product could be produced better and be suitable for use in learning activities. The validation data obtained from the experts and practitioners is listed below:

According to material experts, the quality of the material in the web-based e-module learning media had an average score of 89% across all aspects, making it categorized as very good. Therefore, it was concluded that the web-based e-module met the eligibility requirements in terms of material.According to learning media experts, the validation results averaged 100%, categorizing it as very suitable. Therefore, it can be concluded that the web-based e-module learning media meets the media requirements (Azizah & Ardhana, 2023; Sigalingging et al., 2025).

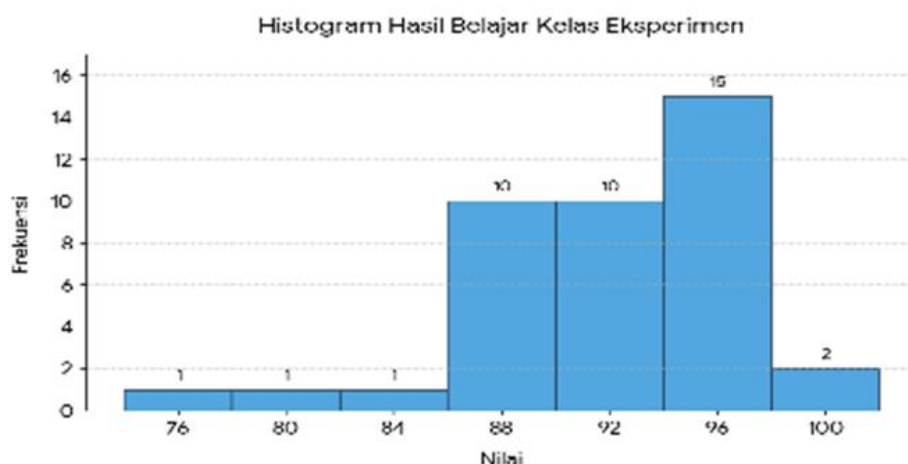
Furthermore, according to design experts, the web-based e-module achieved an average score of 90% across all aspects, categorizing it as very suitable. Therefore, it can be concluded that the web-based e-module learning media meets the design requirements. The overall score obtained by the validation team for the developed web-based e-module reached an average of 93%, meaning it meets the eligibility requirements.

And based on the results of the practicality test in the table above, it was found that the web-based e-module received an average of 94.79% as assessed by teachers and a score of 96.30 by students which falls into the "Very Practical" category. Therefore, it can be concluded that the web-based e-module learning media is very practical to use on the Bhinneka Tunggal Ika material for class XI.

#### Student Learning Outcomes Using Web-Based E-Modules

The results of the study for the experimental class which utilized a web-based e-module within a problem-based learning framework showed a minimum score of 76 and a maximum score of 100. The mean score was 92.00, with a mode of 96 and a standard deviation of 5.04. The following presents the descriptive data for this class.

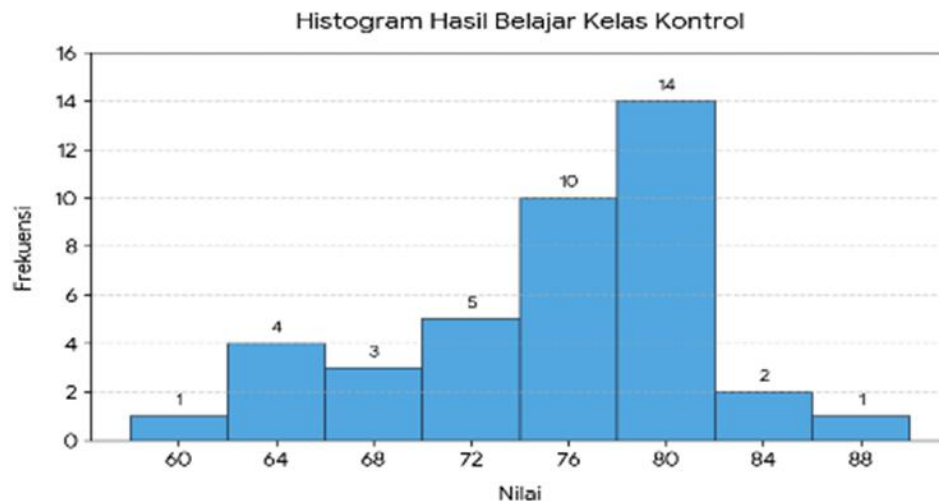
**Figure 1.** Level of Student Experimental Students



#### Student Learning Outcomes Taught Without Using Web-Based E-Modules

The results of the study for the control group show that the lowest student score was 60 and the highest was 88. The mean score was 75.40, with a mode of 80 and a standard deviation of 6.38. These are the descriptive data for the class utilizing the conventional teaching method, also referred to as the control group., referred to as the control class. The student learning outcomes in this control class will be compared with those in the experimental class.

**Figure 2.** Level of Student Control



So, based on the results of the experiment, it can be concluded that the class that learned using e-module learning media had effective learning outcomes and improved learning outcomes compared to the control class that learned without using web-based e-modules.

Referring to the overall presentation above, it can be concluded that the use of web-based e-module learning media for the *Bhinneka Tunggal Ika* (Unity in Diversity) topic in Civics (PPKn) to improve student learning outcomes at Methodist Berastagi Private High School is practical and effective for use in learning activities. This aligns with Edgar Dale's experience-based theory, which states that web-based e-module learning media using a problem-based learning model includes 90% verbal activity throughout the learning process (Desyandri et al., 2024; Mahmudin et al., 2022). Students begin by reading, listening, watching videos, and engaging in discussions to solve problems provided in the e-module. Students then present the results of their discussions and complete exercises to gauge their understanding of the material. This creates a more enriching and engaging learning experience for students.

## CONCLUSION

Based on the findings and discussion, it can be concluded that the developed web-based e-module is highly suitable, practical, and effective for teaching the *Bhinneka Tunggal Ika* (Unity in Diversity) material to grade XI students at Methodist Private High School in Berastagi. The feasibility of the e-module indicates that it meets the required standards in terms of content, instructional design, language, and technical quality, making it an appropriate learning medium for classroom implementation. Its high level of practicality demonstrates that both teachers and students can use the e-module conveniently and efficiently during the learning process. Moreover, the effectiveness of the e-module is reflected in its ability to facilitate student learning and improve learning outcomes, suggesting that it serves as a valuable digital learning resource for enhancing students' understanding of the *Bhinneka Tunggal Ika* material.

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