Original Article

e-ISSN: 2964-7231
p-ISSN: 2614-3658

Original Article

Analysis of the Effectiveness of Interactive E-Modules for OBE-Based History Learning Evaluation with a Team-Based Project Approach

Arfan Diansyah[1]✉, Yushar Tanjung[2], Syahrul Nizar Saragih[3], Abd. Haris Nasution[4]
[1,2,3,4]Department of History Education, Universitas Negeri Medan
Jl. William Iskandar Ps. V, Deli Serdang Regency, Sumatera Utara 20221
Correspondence Author: arfandiansyah@unimed.ac.id✉

Abstract:

This study aims to analyze the effectiveness of the interactive e-module History Learning Evaluation based on Outcome-Based Education (OBE) with a Team-Based Project approach, and assess the feasibility of the developed product. This research is a development research using the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. The research process begins with a preliminary study and needs analysis, design of the e-module prototype, validation by material experts and media experts, product trials on students, and testing the effectiveness of the e-module through learning outcome tests. Data collection techniques include questionnaires and tests, while data analysis is carried out descriptively quantitatively. The results show that the developed interactive e-module obtained a feasibility level of 77% based on the assessment of material experts and 72% based on the assessment of media experts, both of which are included in the feasible category. The effectiveness test results showed an increase in student learning outcomes, with an average score of 63.13 in the initial test increasing to 79.46 in the final test. Based on effectiveness criteria, the interactive e-module of History Learning Evaluation based on OBE with a Team-Based Project approach was declared effective in improving student learning outcomes. Thus, this interactive e-module is suitable and effective for use as supporting teaching materials for the History Learning Evaluation course.

Keywords: Interactive E-Modules, History Learning Evaluation, Outcome-Based Education, Team-Based Projects

Submited	: 21 January 2026
Revised	: 16 February 2026
Acceptance	: 25 February 2026
Publish Online	: 26 February 2026

Introduction

Developments in the 21st century have brought significant changes to the demands of higher education (Chan, 2018; Petrychenko et al., 2023; Khahro & Javed, 2022),

particularly in preparing graduates with competencies relevant to the needs of the workforce and societal dynamics. Universities are no longer solely focused on academic achievement reflected in transcripts, but are also required to produce graduates with measurable, adaptive competencies and the ability to apply knowledge in real-world contexts (Woodside, 2018; Khan et al., 2025; Vlachopoulos, 2025). This situation calls for a renewed learning approach that focuses on learning outcomes and the strengthening of work skills.

The Outcome-Based Education (OBE) approach is one paradigm implemented to address these challenges (Rani, 2020; Zamir et al., 2022; Syeed et al., 2022). OBE emphasizes achieving graduate learning outcomes through integrated and continuous curriculum planning, learning processes, and assessment systems. Hamidi et al. (2024) emphasized that OBE focuses on innovative, interactive, and effective learning processes. OBE implementation encompasses the entire education system, from curriculum design and the development of Semester Learning Plans (RPS) (Ali & Jamin, 2025), the development of teaching materials, the implementation of learning strategies, and the implementation of learning assessments and evaluations (Iqbal et al., 2020).

In the context of OBE implementation, the development of teaching materials is a crucial component in supporting the achievement of learning outcomes (Katawazai, 2021; Kushari & Septiadi, 2022; Aminah et al., 2025). However, in practice, learning in higher education, including in the History Learning Evaluation course, still relies heavily on conventional, textual, and less interactive teaching materials (Tirado-Olivares et al., 2021). This situation results in low student engagement in the learning process, limited opportunities to develop critical thinking skills, and suboptimal reinforcement of the application skills required by prospective history educators (Thornhill-Miller et al., 2023; Koniakhin, 2024; Stasolla et al., 2025). Students need teaching materials that not only present theoretical concepts but also facilitate independent, collaborative, and problem-solving-based learning.

The use of technology in learning provides an opportunity to address these needs through the development of interactive electronic modules (e-modules). E-modules are systematically structured digital learning media designed to support independent learning by combining text, images, audio, and video within a single learning unit (Qurrotu'ain et al., 2024; Daud et al., 2024; Holisoh et al., 2025). The use of interactive e-modules allows students to learn flexibly, increases active participation, and facilitates the achievement of competencies aligned with course learning outcomes.

OBE-based learning also encourages the implementation of activity-and product-oriented learning methods, one of which is the Team-Based Project approach. This approach emphasizes collaborative learning through projects that address real-world problems, enabling students to integrate theoretical knowledge with practical skills. In the context of the History Learning Evaluation course, the Team-Based Project approach provides students with the opportunity to design, develop, and evaluate history learning assessment instruments in a contextual and applicable manner.

The History Learning Evaluation course plays a strategic role in equipping History Education students with the basic competencies of future educators. This course provides an important foundation for instilling an understanding of the concepts, principles, and practices of learning evaluation. However, based on current learning conditions, students still face difficulties in understanding the relationship between evaluation concepts and their application in the classroom, as well as limited teaching materials that support achievement- and project-based learning. Therefore, innovative

teaching materials are needed that can meet student needs and support optimal OBE implementation.

This research was conducted on fourth-semester students of the History Education Department (class of 2022) in the even semester of the 2023/2024 Academic Year as the research population. The research sample was class A students of the History Education Department, Faculty of Social Sciences, Universitas Negeri Medan (Unimed), class of 2021. The selection of research subjects was based on the relevance of the courses being taken and the students' need for innovative teaching materials that support OBE and Team-Based Project-based learning.

Several previous studies have shown that developing e-modules based on OBE and collaborative learning can improve learning quality. Diansyah et al. (2025) stated that e-modules based on the Case Method and Team-Based Projects encourage student-centered learning and improve practical competency. Meanwhile, Sukerti et al. (2024) found that OBE-based teaching materials integrated with online media have a positive impact on improving student literacy.

Based on this description, the development and implementation of an interactive e-module for History Learning Evaluation based on Outcome-Based Education with a Team-Based Project approach is seen as a relevant and strategic need. Therefore, this study aims to analyze the effectiveness of this interactive e-module in supporting the learning process and competency achievement of History Education students as prospective professional educators.

Methods

This research is a research and development (R&D) project aimed at producing and analyzing the effectiveness of an interactive e-module for History Learning Evaluation based on Outcome-Based Education (OBE) using a Team-Based Project approach. The development model used in this study is the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Siregar & Sembiring, 2022; Muliati et al., 2023; Nugroho et al., 2024)

The first stage is analysis. In this stage, the researcher conducted a needs assessment to identify learning problems and needs in the History Learning Evaluation course. The analysis was conducted through mapping of Course Learning Outcomes (CPMK) and analyzing learning activities designed using the Team-Based Project approach. This stage aims to ensure alignment between learning outcomes, learning strategies, and expected competencies in the OBE-based curriculum.

The second stage is design. In this stage, the researcher designed a prototype of the interactive e-module to be developed. The design included the module structure, material presentation, project-based learning activities, and learning evaluation design aligned with OBE principles. The e-module development process utilized the Canva application, which was used to design the visual appearance, layout, and interactive elements within the module.

The third stage is development. At this stage, researchers created a product in the form of an OBE-based interactive e-module according to the previously prepared design. After the product was developed, a validation process was conducted to assess the e-module's feasibility. Validation was conducted by subject matter experts to assess the content and suitability of the material to the CPMK (Competency Standards for Learning), and by media experts to assess the design, layout, and appearance of the e-module. The validation process used a questionnaire. The validation data were then used

as the basis for revising the e-module draft to ensure that the developed product met the feasibility and learning quality criteria.

The fourth stage is implementation. At this stage, the OBE-based interactive e-module, which had undergone validation and revision, was piloted with students. The pilot test was conducted in two stages: a small group trial involving five students and a large group trial involving 20 students. The implementation stage aimed to determine the practicality of using the e-module and student responses to learning using the developed interactive e-module.

The fifth stage is evaluation. At this stage, researchers evaluated the use of the developed and implemented OBE-based interactive e-module. The evaluation was conducted to determine the effectiveness of the e-module in supporting the learning process and student achievement (Rama et al., 2022). Evaluation data were obtained from student learning outcomes collected through learning outcome tests.

Data collection techniques in this study included questionnaires, interviews, and tests (Mustakim et al., 2024). The research instruments used included a questionnaire to measure user feasibility and response, an interview guide to gather supporting information, and a test to measure student learning outcomes. The test instrument used in this study was an essay test, designed to measure students' conceptual understanding and analytical skills regarding the History Learning Evaluation material.

Qualitative data in this study were obtained from data collected during the research process, including field notes from the researcher during interviews and input or comments provided by experts (Hasudungan et al., 2024). Product feasibility analysis was conducted based on data obtained from assessment questionnaires administered to material experts, media experts, and students. The feasibility data analysis used the following formula:

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$

Description:

P = percentage (validity percentage)

∑x = achieved score

∑xi = total number/ideal score

Next, the calculation results are adjusted according to the product feasibility assessment criteria, as shown in the following table.

Table 1. Product Feasibility Assessment Criteria

Percentage (%)	Assessment Criteria
80–100	Very Eligible
60–79	Eligible
40–59	Quite Eligible
20–39	Less Eligible
0–19	Very Less Eligible

Source: Sugiyono (2020)

The effectiveness analysis of the interactive e-module based on Outcome-Based

Education (OBE) was obtained based on student learning outcome test data. The formula used to calculate the effectiveness of the learning product is as follows:

$$P = \frac{F}{N} \times 100$$

Description:
P = percentage achieved
F = total score obtained
N = ideal score
100 = constant

The results of the product effectiveness calculation are then computed into the following assessment criteria.

Table 2. Product Effectiveness Criteria

Percentage	Assessment Criteria
80–100	Very Effective
70–79	Effective
50–69	Less Effective
0–49	Ineffective

Source: Sudjono (2012)

Results

After conducting the analysis stage on the development plan for interactive e-modules based on outcome-based education with a team-based project approach.

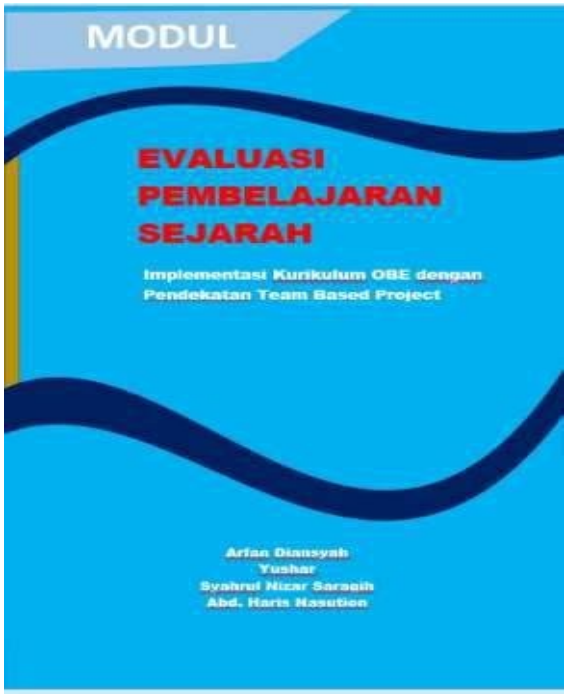
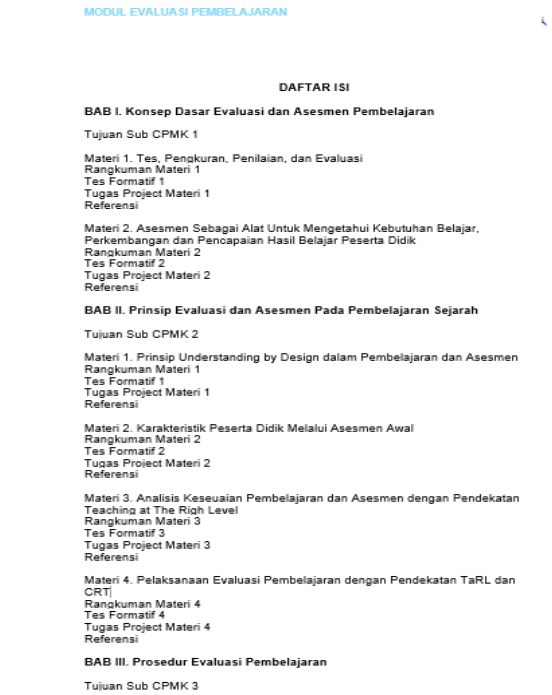


Figure 1. Cover page of the interactive e-module

The next step is to compile the components in the interactive e-module according to the previous planning.



MODUL EVALUASI PEMBELAJARAN

DAFTAR ISI

Figure 2. Interactive E-Module Components

Development Stage

The development stage involves developing narratives for each component of the interactive e-module, adding instructional videos to facilitate student learning.

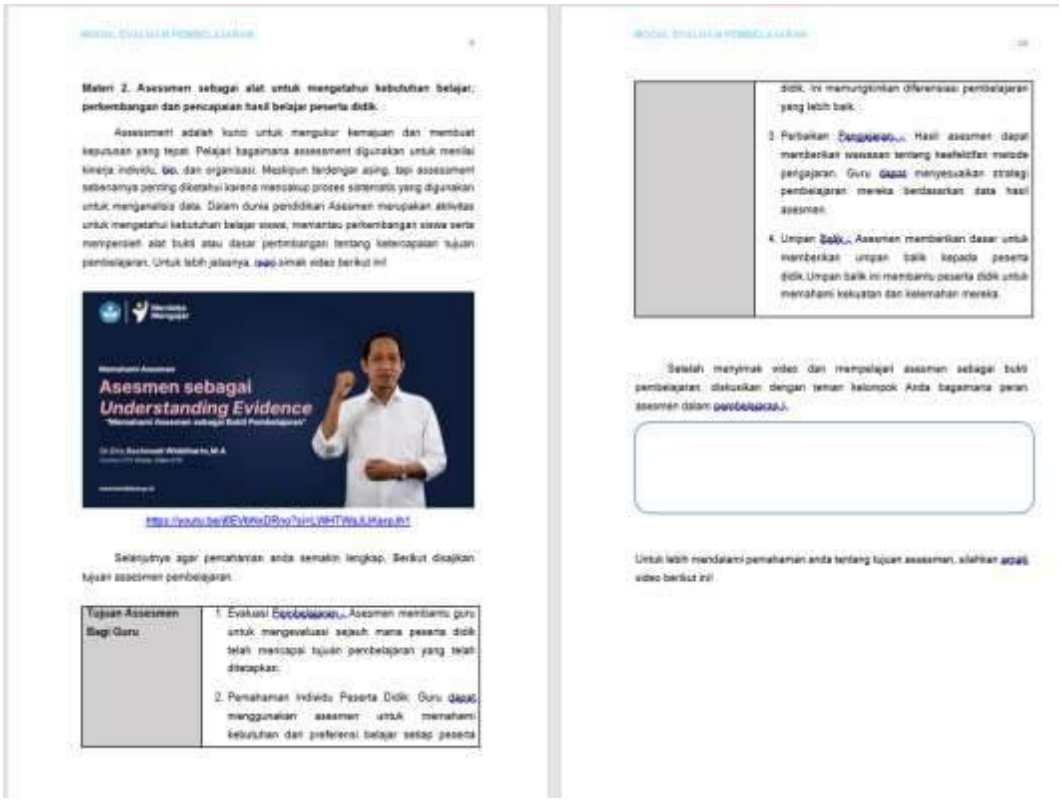


Figure 3. Designing a description of each component of the interactive e-module

1. Material Expert Assessment Phase 1

The material expert assessment was conducted to validate the interactive e-module, based on outcome-based education, developed based on content. The material expert assessment was conducted by Mhd. Ihsan Syahaf Nasution is a lecturer in the History Education Department at Universitas Negeri Medan. The material expert assessment was based on content, presentation, and language aspects.

Table 3. Results of the Material Expert Assessment Stage 1 on the content aspect

No	Indicators	Score	Category
1	Material Suitability to Learning Outcomes	3	Good Enough
2	Material Accuracy	3	Good Enough
3	Material Up-to-Date	3	Good Enough
4	Stimulating Curiosity	3	Good Enough
	Average Total	12	
	Indicators	3.00	Good Enough

The content aspect in the table above consists of four indicators. The total score from the subject matter expert assessment was 12, with an average score of 3.00. These results indicate that, in terms of content, the developed interactive e-module is considered quite good.

Table 4. Results of the assessment of material experts in stage 1 on the presentation aspect

No	Indicators	Score	Category
1	Presentation Techniques	4	Good
2	Presentation Support	4	Good
3	Learning Presentation	3	Good Enough
4	Coherence and Sequence of Thought Flow	3	Good Enough
	Total	14	
	Average	3.50	Good Enough

Based on the table above, the total score of the material experts' assessment on the presentation aspect was 14, with an average score of 3.50. These results indicate that the presentation aspect of the developed interactive e-module is included in the Fairly Good category.

Table 5. Results of the assessment of material experts in stage 1 on the linguistic aspect

No	Indicators	Score	Category
1	Clearness	4	Good
2	Communicative	4	Good
3	Dialogic and Interactive	3	Fairly Good
4	Suitability for Student Development	3	Fairly Good
5	Suitability to Language Rules	3	Fairly Good
	Total	17	
	Average	3.4	Fairly Good

The total score of the material experts' assessment on the linguistic aspect, as shown in the table above, is 17, with an average score of 3.4. These assessment results indicate that, from a linguistic aspect, the developed interactive e-module falls into the Fairly Good category.

Based on the results of the stage 1 material expert assessment based on content, presentation, and language, the average score for these three aspects was 3.30. This result categorizes the stage 1 material expert assessment as quite good. The feasibility percentage for the stage 1 material expert assessment was 66%. This figure can be interpreted as indicating that the developed interactive electronic module falls into the feasibility category. Although the developed e-module has been deemed Feasible, there are several shortcomings based on comments from the material experts for the stage 1 assessment. The following suggestions are: 1) In Chapter 1, material 2 needs to be presented in a table format for student learning assessment; 2) In Chapter 2, the principle of understanding by design in learning and assessment needs to be detailed.

Media Expert Assessment Stage 1

The next stage after the material expert assessment is the assessment by the media expert. For this stage, the media expert appointed was Mr. Ammar Zhafran Ryanto, M.Pd. His appointment was based on his expertise as a lecturer in the learning evaluation course and his expertise in learning evaluation. The media expert's assessment included assessments of text and writing limitations, the quality of the teaching material's presentation, ease of use, appropriate color selection, and the appropriate use of images/videos. The results of the media expert's assessment are outlined in the table below.

Table 6. Results of media expert assessment

No	Indicators	Score	Category
1	Electronic module size	4	Good
2	Electronic module layout design	3	Fairly Good
3	Electronic module content design	3	Fairly Good
4	Accuracy of color selection	3	Fairly Good
5	Accuracy of image/video use	3	Fairly Good
	Total	16	
	Average	3.2	Fairly Good

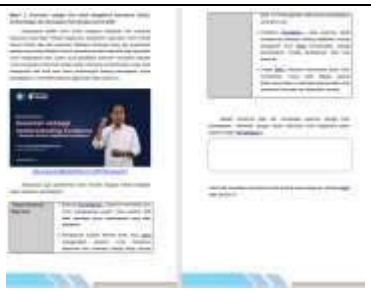
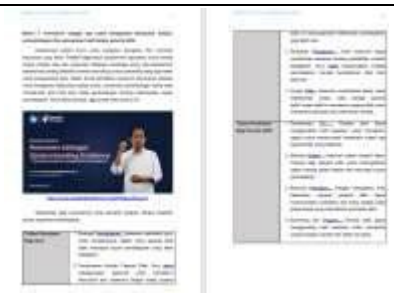
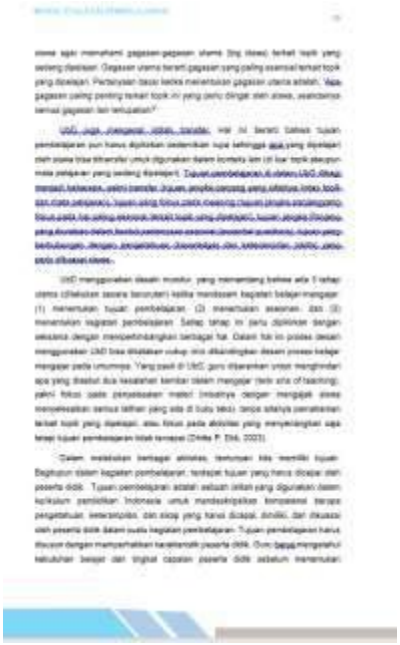
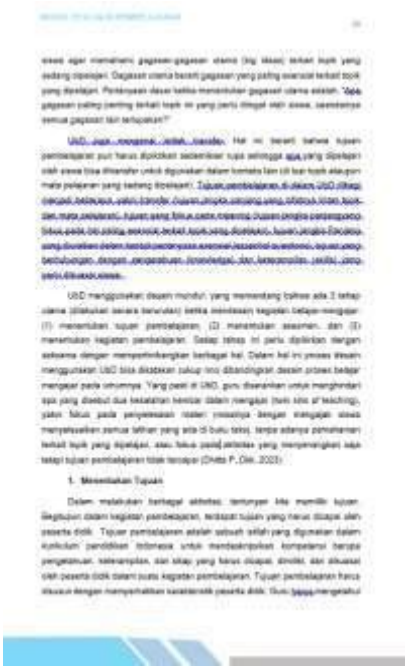
Based on the assessment results by media experts, as presented in the table above, an average score of 3.2 was obtained. This result indicates that the developed interactive e-module falls into the Fair category, in terms of its appearance. When expressed as a percentage, the resulting score is 64%. This result indicates that the product's feasibility, based on the media experts' assessment, falls into the Adequate category.

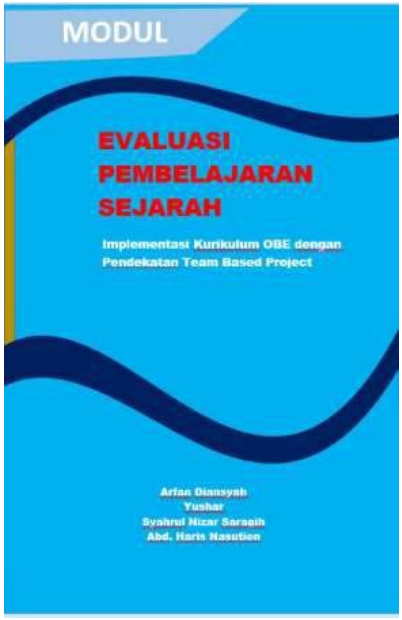
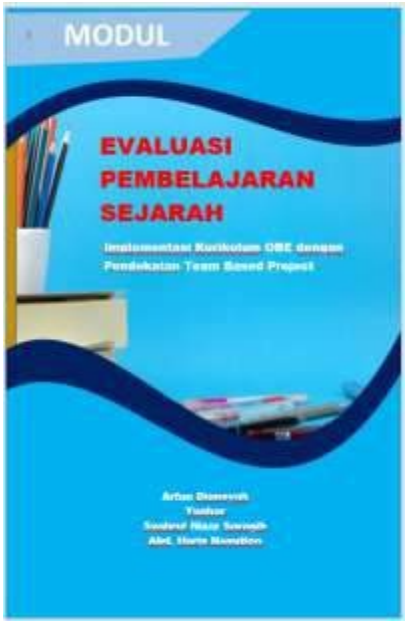
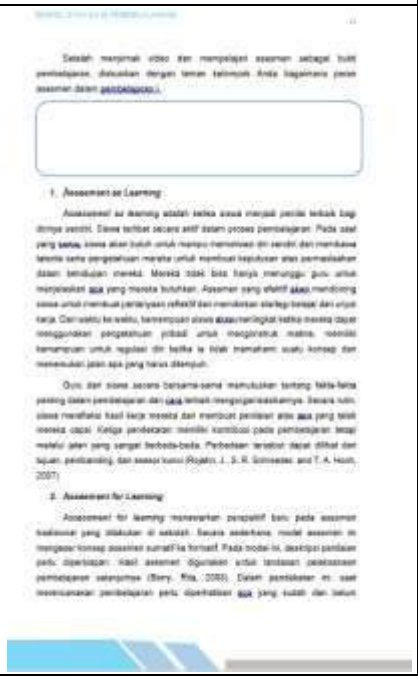
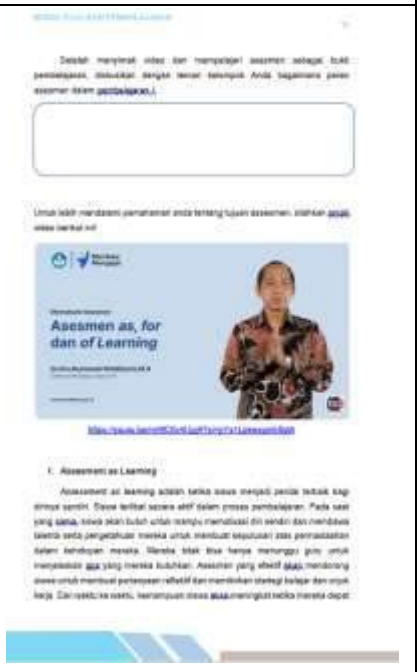
Although the media experts' assessment falls into the Adequate category, the media experts made several revisions, including: 1) The cover section, in relation to the layout design, should be made as attractive as possible. Images should be added to the module cover; 2) Increase the number of videos to increase student learning motivation.

Design Revision

Based on the assessment results from the material and media experts in phase 1, the researchers revised the interactive e-module developed, referring to the experts' assessment notes. The revised results can be seen in the image below:

Table 7. Results of the revised assessment by material and media experts, stage 1

Expert Notes	Before revision	After Revision
In Chapter 1, the objectives of student learning assessment should be presented in a table. Chapter 2 also provides a detailed explanation of the principle of understanding by design in learning and assessment.		
In Chapter 1, the objectives of student learning assessment should be presented in a table. Chapter 2 also provides a detailed explanation of the principle of understanding by design in learning and assessment.		

Regarding the cover, the layout design should be as attractive as possible. It's necessary to add an image to the module cover.		
Increase the number of videos to increase student learning motivation		

Stage 2 Material Expert Assessment

After revision, the researcher then asked the material expert to re-evaluate the revised teaching materials.

Table 8. Results of the Material Expert Assessment Stage 2 on the content aspect

No	Indicators	Score	Category
1	Material Suitability to Learning Outcomes	4	Good
2	Material Accuracy	4	Good
3	Material Up-to-Date	4	Good
4	Stimulating Curiosity	4	Good
	Total	16	
	Average	4.00	Good

Based on the results of the second stage of the material expert assessment, the content aspect obtained a total score of 16 with an average score of 4.00. These results indicate that the interactive e-module developed based on the content aspect is included in the good category.

Table 9. Results of the Material Expert assessment stage 2 on the presentation aspect

No	Indicators	Score	Category
1	Presentation Techniques	4	Good
2	Presentation Support	4	Good
3	Learning Presentation	3	Fairly Good
4	Coherence and Sequence of Thought Flow	4	Good
	Total	15	
	Average	3.75	Fairly Good

The second stage of the material expert assessment, based on the presentation aspect, obtained a score of 15 with an average score of 3.75. This result indicates that the presentation aspect of the developed teaching material falls into the Fairly Good category.

Table 10. Results of the assessment of material experts in stage 2 on the linguistic aspect

No	Indicators	Score	Category
1	Clearness	4	Good
2	Communicative	4	Good
3	Dialogic and Interactive	4	Good
4	Suitability for Student Development	3	Fairly Good
5	Suitability to Language Rules	4	Good
	Total	19	
	Average	3.8	Good

The total score for the subject matter expert assessment on the language aspect, as shown in the table above, was 19, with an average score of 3.80. These assessment results indicate that, from a linguistic perspective, the developed interactive e-module falls into the good category. The average subject matter expert assessment score in stage 2, based on content, presentation, and language, was 3.85. This percentage represents 77%, meaning the product's feasibility, based on the subject matter expert assessment, falls into the Feasible category.

Following the assessment by the subject matter experts in stage 2, the researchers requested a second assessment of the interactive e-module by media experts. The results of the media expert assessment in stage 2 are presented in the table below:

Table 11. Results of stage 2 media expert assessment

No	Indicators	Score	Category
1	Electronic module size	4	Good
2	Electronic module layout design	4	Good
3	Electronic module content design	3	Fairly Good
4	Accuracy of color selection	3	Fairly Good

5	Accuracy of image use	4	Good
	Total	18	
	Average	3.60	Fairly Good

Based on the assessment results by media experts in stage 2, as depicted in the table above, an average score of 3.8 was obtained. This result indicates that the developed interactive e-module falls into the Fair category in terms of its appearance. If this score is expressed as a percentage, the resulting score is 72%. This result indicates that the feasibility value of the product developed, based on the media expert's assessment, falls into the Feasible category.

Effectiveness of Interactive E-Modules based on Outcome-Based Education with a Team-Based Project approach

To test the effectiveness of the interactive e-module, researchers conducted a student learning outcome test in the form of a descriptive test with five questions. Thirty students were tested. The student learning outcome test data can be seen in Table 12 below:

Table 12. Initial Student Learning Outcome Test Scores

Total Score	1894
Average	63.13
Highest Score	75
Lowest Score	63

Based on the table above, it can be seen that the students' initial test results were still relatively low. The average score for the initial test was 63.13. Next, the researchers assessed the students' learning outcomes after participating in three learning sessions using an interactive e-module. The students' learning outcomes were as follows:

Table 13. Final test scores for student learning outcomes

Total Score	2384
Average	79.46
Highest Score	88
Lowest Score	71

Based on the table above, it can be seen that the student learning outcome test after using the interactive e-module was 79.46, which is categorized as good, with the lowest score being 71 and the highest score being 88. A comparison of the results of the initial test and the final test of student learning outcomes between the tests can be seen in the following table:

Table 14. Comparison of the results of the initial test and the final test of student learning outcomes

Number of Students	Average Results	
	Initial Test	Final Test

30	63.13	79.46

Based on the data in the table above, it can be explained that the interactive e-module based on outcome-based education with a team-based project approach in the history learning evaluation course can improve student learning outcomes. In the initial test, the average student score was 63.13 and increased to 79.46. When categorized by effectiveness criteria, it can be concluded that the developed product, in the form of an interactive e-module, is categorized as effective.

Discussion

The History Learning Evaluation course is part of the history education study program and aims to provide students with a deep understanding of the processes, techniques, and tools used to evaluate history learning. Through this course, students are taught skills to improve the quality of learning, measure the achievement of learning objectives, identify student strengths and weaknesses, and learn how to obtain constructive feedback through learning evaluation.

The ability to evaluate learning is a crucial skill for teachers (Kim et al., 2019; Tari & Rosana, 2019; Anggraeni et al., 2023). Learning evaluation not only helps teachers determine the effectiveness of their teaching but also provides valuable information for designing better learning strategies (Hooda et al., 2022; Gao, 2025). With appropriate evaluation, teachers can identify areas for improvement in the learning process. Evaluation helps teachers monitor student progress and identify difficulties they encounter, allowing them to promptly provide needed support (Lo & Hew, 2017; Kamalov et al., 2023; Okafor, 2025). Evaluation also provides data that teachers can use to make better decisions regarding learning strategies, teaching methods, and adapting materials to meet student needs. This also helps teachers plan more effective and relevant learning.

Outcome-Based Education (OBE) is an educational approach focused on achieving specific, predetermined learning outcomes or competencies (Khanna & Mehrotra, 2019; Pradhan, 2021; Ghosh & Sankar, 2025). In the context of learning evaluation, OBE plays a crucial role in ensuring that evaluation results reflect the extent to which students have achieved the stated competencies or objectives. Learning outcomes in learning evaluation courses focus on competencies related to the understanding, application, analysis, and evaluation of the learning process and results.

The development of a history learning evaluation module based on outcome-based education is intended to assist students in the learning process of history learning evaluation courses. The developed module is structured with a clear structure, encompassing learning objectives, materials, examples, exercises, and evaluations (Fernandes et al., 2020; Kusumaningrum et al., 2024; Nur & Sabur, 2025). This module facilitates a gradual and directed understanding of concepts. It provides students with the flexibility to learn at their own pace and time, thus fostering independence in learning and competency achievement.

Team-Based Project is a student-centered learning approach in which students work in teams to complete a specific project (Loyens et al., 2023). This method integrates theory with practice and encourages collaboration, creativity, and problem-solving. The main characteristics of the outcome-based education history learning evaluation module, designed using a team-based project approach, emphasize

collaboration, real-world problems, a results-oriented approach, and an emphasis on process and reflection.

The developed history learning evaluation module aims to provide an in-depth understanding of team-based project-based history learning evaluation. This module discusses various concepts, methods, and steps in designing and implementing effective evaluations for team-based projects. Through the developed learning evaluation module, students are encouraged to work in small, heterogeneous groups to encourage the exchange of ideas and skills. The projects assigned are real-life problems or case simulations relevant to real-life issues in schools.

By utilizing a team-based project approach in the history learning evaluation module, students can develop critical thinking skills, technical skills, and collaborative skills in solving problems together and encourage the application of theory into real practice so that students as prospective teachers can prepare themselves to face the world of work.

Conclusion

The conclusion contains a few simple sentences that answer the problem formulation or research objective presented in the beginning. The form of the sentence is not permitted to contain theories or formulas or statistical symbols. The writing systematics is aligned left-right and only the first line is indented into 7 letters using the usual Georgia font letter 11. No need to write suggestions or recommendations The development of an interactive e-module based on outcome-based education with a team-based project approach in the history learning evaluation course emphasizes the learning process that has a final result in the form of a product. Through the developed interactive e-module, students are given the freedom to carry out their learning activities and work on learning projects through activities forming study groups in working on projects, experiments, and innovations. The purpose of learning using this e-module is to connect the knowledge gained by students by raising real problems that occur in schools and the experiences of teachers in creating solutions to existing problems. The results of the study show that the developed interactive e-module obtained a feasibility level of 77% based on the assessment of material experts and 72% based on the assessment of media experts, both of which are included in the feasible category. The results of the effectiveness test showed an increase in student learning outcomes, with an average score of 63.13 in the initial test increasing to 79.46 in the final test. Based on the effectiveness criteria, the interactive e-module of History Learning Evaluation based on OBE with a Team-Based Project approach was declared effective in improving student learning outcomes. Thus, this interactive e-module is suitable and effective for use as supporting teaching materials for the History Learning Evaluation course. Thus, learning using this e-module is an effective strategy in providing high relevance to achieving competencies needed in the world of work. Based on the results of the study, it is recommended that research on the development of interactive e-modules based on outcome-based education can become a development program in the Department of History Education, State University of Medan.

References

Ali, R., & Jamin, H. (2025). Curriculum Development Strategy Based on Outcome Based Education (OBE) to Improve the Quality of Education in Higher Education. *Journal of Education and Religious Studies*, *5*(02), 103–109.

https://doi.org/10.57060/jers.s9w3x850
Aminah, S., Krisnadhi, A. A., & Hidayanto, A. N. (2025). Ontological Framework for the Analysis of Outcome-Based Curriculum in Higher Education. *IEEE Access*, *13*, 31497–31516. https://doi.org/10.1109/ACCESS.2025.3542881
Anggraeni, D. M., Prahani, B. K., Suprapto, N., Shofiyah, N., & Jatmiko, B. (2023). Systematic review of problem based learning research in fostering critical thinking skills. *Thinking Skills and Creativity*, *49*, 101334. https://doi.org/10.1016/j.tsc.2023.101334
Chan, S. (2018). A review of twenty-first century higher education. *Journal of Further and Higher Education*, *42*(3), 327–338. https://doi.org/10.1080/0309877X.2016.1261094
Daud, A., Linda, R., Harfal, Z., Nabila, O., Suryani, A., & Tahirah, Z. (2024). Multimodal Text-Powered Interactive E-Module for Enhancing English Structure Learning. *REiLA : Journal of Research and Innovation in Language*, *6*(1), 1–20. https://doi.org/10.31849/reila.v6i1.15988
Diansyah, A., Nasution, A. H., Yushar, Y., & Saragih, S. N. (2025). *Development of Interactive E-Module for History Learning Evaluation Course Based on Outcome Based Education With Team-Based Project Approach* (pp. 418–430). https://doi.org/10.2991/978-2-38476-499-0_34
Fernandes, R. A. M. L., de Oliveira Lima, J. T., da Silva, B. H., Sales, M. J. T., & de Orange, F. A. (2020). Development, implementation and evaluation of a management specialization course in oncology using blended learning. *BMC Medical Education*, *20*(1), 37. https://doi.org/10.1186/s12909-020-1957-4
Gao, Y. (2025). Deep learning-based strategies for evaluating and enhancing university teaching quality. *Computers and Education: Artificial Intelligence*, *8*, 100362. https://doi.org/10.1016/j.caeai.2025.100362
Ghosh, S., & Sankar, C. S. (2025). Outcome-Based Teacher Education: A New Era in Teacher Preparation. *The Journal of Quality in Education*, *15*(25), 36–54. https://doi.org/10.37870/joqie.v15i25.461
Hamidi, H., Hejran, A. B., Sarwari, A., & Edigeevna, S. G. (2024). The Effect of Outcome Based Education on Behavior of Students. *European Journal of Theoretical and Applied Sciences*, *2*(2), 764–773. https://doi.org/10.59324/ejtas.2024.2(2).68
Hasudungan, A. N., Suboh, A. S., & Nababan, S. A. (2024). Urgency of Evaluation of Sekolah Penggerak Program Through the Cipp Model (Context, Input, Process, Product): A Critical Study. *Education & Learning*, *4*(1), 23–32. https://doi.org/10.57251/el.v4i1.1288
Holisoh, A., Pahamzah, J., & Hidayat, S. (2025). Literature Review on the Use of Electronic Modules in Independent Learning in Higher Education. *Journal of General Education and Humanities*, *4*(1), 153–164. https://doi.org/10.58421/gehu.v4i1.368
Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial Intelligence for Assessment and Feedback to Enhance Student Success in Higher Education. *Mathematical Problems in Engineering*, *2022*, 1–19. https://doi.org/10.1155/2022/5215722
Iqbal, S., Willis, I., H. Almigbal, T., Aldahmash, A., & Rastam, S. (2020). Outcome-based education: evaluation, implementation and faculty development. *MedEdPublish*, *9*, 121. https://doi.org/10.15694/mep.2020.000121.1
Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution. *Sustainability*, *15*(16), 12451. https://doi.org/10.3390/su151612451
Katawazai, R. (2021). Implementing outcome-based education and student-centered learning in Afghan public universities: the current practices and challenges. *Heliyon*, *7*(5), e07076. https://doi.org/10.1016/j.heliyon.2021.e07076
Khahro, S. H., & Javed, Y. (2022). Key Challenges in 21st Century Learning: A Way

Forward towards Sustainable Higher Educational Institutions. *Sustainability*, *14*(23), 16080. https://doi.org/10.3390/su142316080

Khan, H. M., Singh, M., & R, L. (2025). Beyond Transcripts: A Learner-Centred Review for Closing the Graduate Skills Gap. *2025 6th International Conference on IoT Based Control Networks and Intelligent Systems (ICICNIS)*, 1509–1515. https://doi.org/10.1109/ICICNIS66685.2025.11315761

Khanna, R., & Mehrotra, D. (2019). The roadmap for quality improvement from traditional through competency based (CBE) towards outcome based education (OBE) in dentistry. *Journal of Oral Biology and Craniofacial Research*, *9*(2), 139–142. https://doi.org/10.1016/j.jobcr.2019.02.004

Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st-century learners. *Research in Comparative and International Education*, *14*(1), 99–117. https://doi.org/10.1177/1745499919829214

Koniakhin, Y. (2024). THE MODEL OF MOTIVATIONAL AND VALUE DETERMINATION OF THE FORMATION OF PROFESSIONAL COMPETENCES OF FUTURE HISTORY TEACHERS IN THE PROCESS OF STUDYING PROFESSIONAL DISCIPLINES. *Педагогічна Наука і Освіта XXI Століття*, *3*. https://doi.org/10.35619/pse.vi3.62

Kushari, B., & Septiadi, L. (2022). A learning outcome assessment information system to facilitate Outcome-Based Education (OBE) implementation. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *28*(2), 238–250. https://doi.org/10.21831/jptk.v28i2.42339

Kusumaningrum, B., Istiqomah, I., & Langobelen, P. D. S. (2024). Development of Tri-N (niteni, nirokke, nambahi) based e-modules on linear equations material for junior high school students. *Union: Jurnal Ilmiah Pendidikan Matematika*, *12*(3), 483–493. https://doi.org/10.30738/union.v12i3.17203

Lo, C. K., & Hew, K. F. (2017). A critical review of flipped classroom challenges in K-12 education: possible solutions and recommendations for future research. *Research and Practice in Technology Enhanced Learning*, *12*(1), 4. https://doi.org/10.1186/s41039-016-0044-2

Loyens, S., Wijnia, L., van der Sluijs, I., Ferrer, E., & Rikers, R. (2023). Student-Centered Learning with Large Student Groups: Rationale, Organization, and Experiences in Problem-, Project-, and Team-Based Learning. In *Pedagogy and Psychology in Digital Education* (pp. 17–47). Springer Nature Singapore. https://doi.org/10.1007/978-981-99-2107-2_2

Muliati, I., Alfurqan, A., Murniyetti, M., & Sulaiman, S. (2023). OBAMATARE-Alquran: The Syntax of the Quran-Based CTL Model in the Learning of Islam Religious Education in Higher Education. *AL-ISHLAH: Jurnal Pendidikan*, *15*(2), 1714–1722. https://doi.org/10.35445/alishlah.v15i2.3019

Mustakim, M., Suastra, I. W., & Lasmawan, I. W. (2024). THE INDEPENDENT CURRICULUM IN EDUCATIONAL THEORY REVIEW: CHALLENGES AND SOLUTIONS. *Realita : Jurnal Bimbingan Dan Konseling*, *9*(2), 2480. https://doi.org/10.33394/realita.v9i2.12391

Nugroho, A. N. P., Adeduntan, R. I., & Tariq, A. A. (2024). General Soedirman: History Learning Media Based on Digital Comics. *Journal Evaluation in Education (JEE)*, *5*(1), 10–16. https://doi.org/10.37251/jee.v5i1.839

Nur, M., & Sabur, F. (2025). Development of Teaching Materials and Harmonized Semester Learning Plan for the Aircraft Basic Workshop Theory Course through Learner-Centered Instructional Design in Indonesian Aviation Polytechnics. *Journal La Edusci*, *6*(2), 284–308. https://doi.org/10.37899/journallaedusci.v6i2.2244

Okafor, J. O. (2025). The Role of Digital Tools in Assessment and Their Impact on Educational Practices. *Indonesian Journal of Innovative Teaching and Learning*, *2*(1), 58–71. https://doi.org/10.64420/ijitl.v2i1.202

Petrychenko, O., Petrichenko, I., Burmaka, I., & Vynohradova, A. (2023). Changes in modern university: challenges of today and development trends. *Collection of Scientific Works of the State University of Infrastructure and Technologies Series "Transport Systems and Technologies," 41*, 74–83. https://doi.org/10.32703/2617-9059-2023-41-6

Pradhan, D. (2021). Effectiveness of Outcome Based Education (OBE) toward Empowering the Students Performance in an Engineering Course. *Journal of Advances in Education and Philosophy*, *5*(2), 58–65. https://doi.org/10.36348/jaep.2021.v05i02.003

Qurrotu'ain, S., Shohib, M. W., & Nubail, A. (2024). The Effectiveness of Using E-Modules as Digital Learning Media in the Learning of Islamic Education. *Iseedu: Journal of Islamic Educational Thoughts and Practices*, *8*(2), 185–196. https://doi.org/10.23917/iseedu.v8i2.8999

Rama, A., Putra, R. R., Huda, Y., & Lapisa, R. (2022). Pengembangan E-Modul Menggunakan Aplikasi Flip Pdf Professional Pada Mata Kuliah Analisis Kurikulum Pendidikan Dasar. *JRTI (Jurnal Riset Tindakan Indonesia)*, *7*(1), 42–47. https://doi.org/10.29210/30031473000

Rani, C. N. (2020). A Study On Outcome-Based Education – Issues And Challenges. *International Review of Business and Economics*, *4*(2), 271–279. https://doi.org/10.56902/IRBE.2020.4.2.50

Siregar, A. G., & Sembiring, F. (2022). Interactive Learning Content Using H5P in Pronunciation Course. *Journal of Education, Humaniora and Social Sciences (JEHSS)*, *5*(2), 1219–1225. https://doi.org/10.34007/jehss.v5i2.1474

Stasolla, F., Zullo, A., Maniglio, R., Passaro, A., Di Gioia, M., Curcio, E., & Martini, E. (2025). Deep Learning and Reinforcement Learning for Assessing and Enhancing Academic Performance in University Students: A Scoping Review. *AI*, *6*(2), 40. https://doi.org/10.3390/ai6020040

Sudjono. (2012). *Pengertian Evalusi Pendidikan*. PT. Raja Grafindo.

Sugiyono. (2020). *Metode Penelitian Kuantitatif kualitatif dan R&D*. Alfhabeta.

Sukerti, G. N. A., Handayani, L. N. C., Laksana, I. P. Y., & Virginiya, P. T. (2024). *Crafting IT English Teaching Materials based on Outcome-Based Education with a Character-Enriched Flipped Classroom Method* (pp. 87–96). https://doi.org/10.2991/978-94-6463-622-2_11

Syeed, M. M., Shihavuddin, A., Uddin, M. F., Hasan, M., & Khan, R. H. (2022). Outcome Based Education (OBE): Defining the Process and Practice for Engineering Education. *IEEE Access*, *10*, 119170–119192. https://doi.org/10.1109/ACCESS.2022.3219477

Tari, D. K., & Rosana, D. (2019). Contextual Teaching and Learning to Develop Critical Thinking and Practical Skills. *Journal of Physics: Conference Series*, *1233*(1), 012102. https://doi.org/10.1088/1742-6596/1233/1/012102

Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J.-M., Morisseau, T., Bourgeois-Bougrine, S., Vinchon, F., El Hayek, S., Augereau-Landais, M., Mourey, F., Feybesse, C., Sundquist, D., & Lubart, T. (2023). Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education. *Journal of Intelligence*, *11*(3), 54. https://doi.org/10.3390/jintelligence11030054

Tirado-Olivares, S., Cózar-Gutiérrez, R., García-Olivares, R., & González-Calero, J. A. (2021). Active learning in history teaching in higher education: The effect of inquiry-based learning and a student response system-based formative assessment in teacher training. *Australasian Journal of Educational Technology*, *37*(5), 61–76. https://doi.org/10.14742/ajet.7087

Vlachopoulos, D. (2025). *AUTHENTIC ASSESSMENT: BRIDGING HIGHER EDUCATION AND REAL-WORLD SKILLS THROUGH DIVERSE METHODOLOGIES*. 2225–2234. https://doi.org/10.21125/inted.2025.0628

Woodside, J. M. (2018). Real-world rigour. *Industry and Higher Education*, *32*(5),

285–289. https://doi.org/10.1177/0950422218784535
Zamir, M. Z., Abid, M. I., Fazal, M. R., Qazi, M. A. A. R., & Kamran, M. (2022). Switching to Outcome-Based Education (OBE) System, a Paradigm Shift in Engineering Education. *IEEE Transactions on Education*, *65*(4), 695–702. https://doi.org/10.1109/TE.2022.3169184