



Development of Project-Based Learning Oriented Teaching Materials for Elementary School Learning Media Course in the OBE-Based *Merdeka Curriculum*

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Abstract

This research aims to develop project-based learning-oriented teaching materials for the elementary school learning media course in the OBE-based Merdeka Curriculum to improve the student's learning process, using the ADDIE development model. Designed for the elementary school teacher education program at I Gusti Bagus Sugriwa Denpasar State Hindu University, the process included needs analysis, material design, development (lesson plans and modules), and validation by five experts evaluating content, media, and language. Effectiveness and practicality were assessed through lecturer and student response questionnaires. Results show the teaching material is valid and practical, with lesson plans rated “very feasible,” modules achieving a positive Content Validity Ratio (CVR > 0), and high practicality scores (93 percent and 92.65 percent). These findings indicate strong acceptance by both lecturers and students. The integration of Outcome-Based Education (OBE), the Merdeka Curriculum, and Project-Based Learning (PjBL) within a single instructional resource offers a new model connecting theory, practice, and real classroom application.

Keywords: elementary school; *merdeka* curriculum; outcomes-based education (OBE); project-based learning (PjBL); teaching materials development.

INTRODUCTION

Current developments in education demand innovation in the learning process. Learning innovation is crucial to adapt to global dynamics and technological advancements. Universities can no longer rely solely on theory-based learning; students also need contextual and applicable learning experiences. As institutions producing competitive human resources, universities must be able to adapt flexible, relevant, and skills-based curricula. Interactive, collaborative, and project-based learning approaches are becoming an unavoidable necessity (Pertiwi et al., 2024).

I Gusti Bagus Sugriwa Denpasar State Hindu University as an educational institution, is committed to improving the quality of learning by implementing the *Merdeka Curriculum* based on Outcome-Based Education (OBE) starting in the 2024-2025 academic year. This curriculum aims to guarantee that graduates not only understand theory but also have the practical skills and creativity required in the job market (Siregar, Mukhtar, Anwar, & Munte, 2024). The

implementation of OBE emphasizes the achievement of predetermined learning outcomes (Gea & Koto, 2024).

The OBE approach directs the entire learning process, from curriculum design, teaching methods, to assessment systems, oriented towards ensuring that students achieve the expected competencies (Handayani & Zaim, 2023). OBE focuses on students as the center of learning, while lecturers act as facilitators (Rasyid et al., 2022). The learning methods used in OBE often involve active approaches, such as Project-Based Learning (PjBL), Problem-Based Learning (PBL), and collaborative learning (Muis & Dewi, 2021). Furthermore, assessment in OBE relies not only on written exams but also on authentic assessments such as projects, portfolios, and hands-on practice (Fuadin & Fauziya, 2022).

The Elementary School Teacher Education Study Program at I Gusti Bagus Sugriwa Denpasar State Hindu University in Denpasar is one of the study programs that also implements the OBE-based *Merdeka* Curriculum. One of the key subject in this program is elementary school learning media. It plays a crucial role in preparing prospective elementary school teachers to design and use effective and innovative learning media. However, currently, the Elementary School Teacher Education Study Program does not yet have OBE-based teaching materials, including semester lesson plans and modules specifically for the elementary school learning media course. Even in current learning, it is still theory-based and does not fully accommodate the needs of practice and 21st-century skills. This presents a challenge in achieving the goals of the *Merdeka* Curriculum, which emphasizes measurable learning outcomes pertinent to the demands of the field of education. Responding to this condition, innovations such as teaching materials for the elementary school learning media course are needed.

The development of project-oriented instructional materials is expected to address these challenges. These teaching materials not only present learning materials but are designed to engage students in real-life projects that enhance creativity and practical skills (Manurung, Haloho, & Napitu, 2023; Dafit & Mustika, 2021; Steffi & Syastra, 2015). Project-based learning enhances students' creativity, collaboration, problem-solving, and critical thinking skills (Nurhayati & Hariyanti, 2019; Trimuliani, Azizah, Sofiati, & Untari, 2024). The use of PjBL in elementary school learning media courses helps students produce applicable and innovative learning media products (Yektyastuti, 2024).

Several previous studies have demonstrated the effectiveness of project-based learning materials in improving creativity and problem-solving skills. However, research focusing on their integration into the OBE-based *Merdeka* Curriculum remains limited. In general, the use of structured teaching materials, such as semester lesson plans and learning modules, has been proven to significantly enhance students' cognitive abilities, creativity, and engagement (Magdalena, Sundari, Nurkamilah, & Amalia, 2020; Dafit & Mustika, 2021; Samsu, Mustika, Nafaida, & Manurung, 2020; Sapriyah, 2019). Specifically, Nisrina, Rokhmawati, & Afirianto (2021) found that using project based learning modules not only supports students' theoretical understanding but also encourages them to apply knowledge through creative projects. This finding aligns with research by Susanti, Fitriani, & Sari (2020) as well as Ismanto, Vitriani, & Anshari (2022), who emphasized that student creativity develops through exploration, experimentation, and problem-solving during project implementation that held in the classroom or other education setting.

Moreover, essential 21st-century skills such as problem-solving, communication, and teamwork are also strengthened, as project based-learning inherently requires students to collaborate in planning and executing their projects (Kisworo, Mutiaradewi, & Dewiantika, 2021). Taken together, these studies indicate that the use of PjBL modules represents an effective pedagogical approach for improving student competencies across various scientific disciplines (Antari, Widiana, & Wibawa, 2023; Lubis & Matondang, 2024). Therefore, in this study, the PjBL approach was adopted because it has consistently proven effective in fostering critical, creative, and collaborative thinking, principles that are in line with Outcome-Based Education (OBE). Through real-world projects, students are encouraged to connect theory with practice, enabling them to apply their knowledge in contexts relevant to elementary education and to be better prepared for professional challenges (Wulandari, Arifin, Cahyono, & Kusumawardani, 2021); Telkom, 2021; Martini, Saryanto, Dewi, Hasan, & Soni, 2022; Sobri, Mustofa, & Yusup, 2024; Muzakir, 2023).

This research is important to support the curriculum in the elementary school degree study program, particularly in the elementary school learning media course. It focuses on developing instructional resources based on a project-oriented approach that can foster students' creativity. Through the use of this resource, students are expected to comprehend theories of learning media and apply them in practical projects relevant to elementary education. This study contributes to the creation of learning tools that align with 21st-century educational demands and serves as a model for developing a more comprehensive project-oriented approach in higher education. The learning objectives outlined in the OBE-based *Merdeka* Curriculum framework should be achieved collaboratively by lecturers and students through the use of this resource.

A significant innovation introduced in this study is the integration of Project-Based Learning (PjBL), Outcome-Based Education (OBE), and *Merdeka* Curriculum into a single, student-centered instructional design. This method addresses existing shortcomings such as reliance on lectures, limited real-world application, and insufficient support for contemporary skill development. The integration of OBE, *Merdeka* Curriculum, and PjBL ensures that the developed instructional resources are competency-driven (OBE), flexible and experiential (*Merdeka* Curriculum), and promote authentic learning through real projects (PjBL).

Several previous studies have explored the use of semester lesson plans and modules that apply project-based approaches in education. However, research specifically developing PjBL-oriented materials tailored to the needs of the elementary school degree program's elementary school learning media course remains limited. The novelty of this study lies in its holistic integration of the three pedagogical paradigms: OBE, *Merdeka* Curriculum, and PjBL, within one instructional resource, providing a new model that connects theory, practice, and real classroom contexts in teacher education. Consequently, this research is expected to significantly advance the development of innovative and relevant learning materials aligned with the goals of the OBE-based *Merdeka* Curriculum.

METHOD

This study employed a Research and Development (R&D) design aimed at developing teaching materials for the elementary school learning media course based on the Project-Based Learning (PjBL) approach. The developed products consisted of a semester lesson plan and a

course module. The research was conducted in the Elementary School Teacher Education Study Program, Faculty of Dharma Acarya, I Gusti Bagus Sugriwa Denpasar State Hindu University, involving lecturers and fourth-semester students of the 2024/2025 academic year.

This study followed the ADDIE development model, consisting of five systematic phases: Analysis, Design, Development, Implementation, and Evaluation. The analysis phase involved a comprehensive needs analysis, curriculum analysis, and learner characteristics analysis. The needs analysis identified learning problems in the elementary school learning media course and the necessity of project-based modules that could enhance conceptual understanding and practical teaching skills aligned with the *Merdeka* Curriculum graduate profile. Curriculum analysis was conducted to ensure that the module content and structure aligned with course learning outcomes and the OBE framework. Additionally, the analysis of student characteristics examined prior knowledge, learning preferences, and technology readiness to design a suitable and engaging module. The results of this phase guided the formulation of learning objectives and the structure of the module.

The design phase involved formulating the semester lesson plan, designing the module framework, selecting learning media, planning supporting materials, and preparing validation instruments. The structure was arranged to reflect project-based learning principles and promote student-centered learning activities. The development phase included compiling, producing, and validating the draft module. The draft was developed based on the designed framework and validated by five experts consisting of two material experts, two media experts, and one language expert. Validation focused on aspects of content relevance, instructional design, language clarity, and media presentation. Revisions were made based on expert feedback to improve accuracy, clarity, and usability until the module met the validity criteria.

The implementation phase involved testing the validated module in real classroom settings. The implementation was conducted with 55 fourth-semester students and two lecturers teaching the course. This stage aimed to evaluate the practicality and effectiveness of the module in facilitating active and project-based learning. The evaluation phase combined the results of expert validation, lecturer and student feedback, and classroom observations. The evaluation outcomes were used to refine and improve the final product, including adjustments to project activities, simplification of language, and improvement of visual layout to enhance user engagement and learning effectiveness.

The instruments used in this study included: (1) expert validation questionnaires for the module, (2) semester lesson plan validation questionnaires, (3) student response questionnaires, and (4) lecturer response questionnaires. Data were analyzed using both quantitative and qualitative descriptive methods. The Content Validity Ratio (CVR) was used to determine the validity level of the module, where $CVR > 0$ indicates valid, $CVR = 0$ indicates the need for revision, and $CVR < 0$ indicates invalidity. The practicality level of the module was categorized using the ideal mean and ideal standard deviation formula. The practicality questionnaire, consisting of 10 items on a 5-point Likert scale, produced a maximum score of 50 and a minimum of 10. Based on the calculated ideal mean 30 and ideal deviation standard 10, the total score intervals were determined to classify the practicality of the developed module, as presented in Table 1.

Table 1. Convert Quantitative to Qualitative Data

Total Score	Category
$X > 48$	Excellent
$36 < X \leq 48$	Good
$24 < X \leq 36$	Enough
$12 < X \leq 24$	Less
$X \leq 12$	Very Lacking

RESULT AND DISCUSSION

Result

Through the ADDIE model, research has been conducted to develop teaching materials for elementary school learning media courses oriented towards project-based learning. In the first stage, analysis was done through interviews, observation, and review of earlier instructional materials. The discussion method was also used by involving lecturers in charge of elementary school learning media courses. The results of the analysis stage include: students need teaching materials for elementary school learning media that contain concise and applicable material explanations, concrete explanations containing systematic guidelines for media creation and preparation of project-based reports.

Lecturers also need non-theoretical teaching materials to support the project-based learning flow to align with the current curriculum, namely the OBE-based *Merdeka* Curriculum. In addition, lecturers also need teaching materials that contain systematic steps for project-based learning, complete with examples and assessments so that they can be used to monitor student performance in lectures. Additionally, the analysis's findings indicate that teaching materials for the elementary school learning media course in the OBE-based *Merdeka* Curriculum are also not yet available in the department. Even though the existence of these teaching materials will later help lecturers and students in achieving graduate learning objectives. Thus, the need for teaching materials for this elementary school learning media course is crucial.

At the design stage, several things are done, namely; formulating the semester lesson plan, preparing the module framework, planning media and supporting materials in the module and preparing validation instruments. The semester lesson plan is prepared by combining and compiling all learning objectives that have been obtained in the previous stage into one unit by adjusting it to the study materials, learning materials, forms of assessment, learning methods, student assignments and assessment weights. The preparation of the semester lesson plan has also been adjusted to the OBE curriculum semester lesson plan format used at I Gusti Bagus Sugriwa Denpasar State Hindu University. The semester lesson plan design is then discussed within the team. The results of the discussion within the team are used as a basis for refining the semester lesson plan before the development of it. The module is then compiled by paying attention to the suitability of the learning objectives in the semester lesson plan. The front section of the module is presented on Figure 1.



Figure 1. Front view of the module

The module is a component of the instructional resources created during this study. The first step in developing a module is to match the findings of the needs analysis with the study guides or instructional materials for the learning media course in elementary school. After being adjusted, the course module framework is obtained, consisting of learning objectives, activity descriptions, core materials, project activities, project assessments, and personal reflections. This framework is outlined in all chapters in the course module. After determining the module chapters, the module sections are arranged in each chapter, consisting of learning objectives, activity descriptions, core materials, project activities, project assessments, personal reflections, summaries, and bibliographies. The initial section of the module contains the front page (cover), foreword, course overview, elementary school learning media competency map, module usage instructions for lecturers and students, and a table of contents.

After the development phase, including the semester lesson plan, module, and research instrument, was completed, the next stage was validation of the research instrument by two experts. The instrument, which was declared valid, was then used to validate the semester lesson plan and module. The module was validated by five experts. Aspects of the module included content, media, and language. Feedback from these experts was used to revise and improve the module's quality.

The aspects assessed for the validity of the semester lesson plan are (1) suitability of the lesson plan format, (2) formulation of learning outcomes, (3) suitability of the material to the learning objectives, (4) learning strategies, (5) assessment system, and (6) reference sources. The validation results are presented in the following summary of validation results.

Table 2. Recapitulation of the Validity

Validator	Average Score	Percentage	Criteria
Lecturer 1	50	100%	Very Worthy
Lecturer 2	48	96%	Very Worthy

Based on the validation score criteria (Halimah & Kurniawati, 2022), the learning objectives was declared very worthy. The validator suggested improvements to the semester lesson plan, including strengthening the link between learning outcomes from learning objectives and adding a more detailed project assessment rubric. Aspects assessed for module validity include: (1) content, including content appropriateness, presentation components, and attractiveness; (2) media, including module size, module content and cover design; and (3) language, including efficacy, appropriateness, and clarity. The following are the findings of the module validation.

Table 3. Recapitulation of the Validity

Validity Aspects	CVR	Category
Content	1	Valid
Media	1	Valid
Language	1	Valid

It is evident from the statistics that every validation component is legitimate, with a Content Validity Ratio (CVR > 0). Thus, the developed module can be considered valid and prepared for the trial phase. In addition to the quantitative results, qualitative feedback from lecturers indicated that the module effectively integrated theory with practical project implementation. However, they suggested adding more varied examples of project topics relevant to elementary school contexts and improving the visual consistency between sections. Lecturers also appreciated the module's clear structure and interactive elements that encourage student autonomy in learning. These inputs were used to refine the final version of the module before implementation.

The teaching materials were tested through a field trial of the module. The field trial involved 55 students and two lecturers. The results of the field trial are as follows: (1) Students were able to use the module effectively both independently and in groups. The module provided helped students understand the material presented in each meeting. Students had no difficulty finding resources because it had been prepared in the form of a course module. (2) Because the module included summaries, personal thoughts, and core material, students seemed to be able to comprehend the content in a more organized way. The seamless conversations that took place during the module discussion demonstrated this. (3) Students gained experience designing learning media based on the module's instructions, making the delivery of the material by lecturers easier. New students were then encouraged to ask questions to the lecturer. (4) Lecturers were able to effectively utilize the module in their lessons. The instructions provided in the module were easy to understand, and they were able to easily implement lessons that combined theory and practice.

Based on the answers to a questionnaire given to students and lecturers about the primary school learning media module, the usefulness of the teaching resources for the course was evaluated. The questionnaire was administered to two lecturers and 55 students after learning

using the elementary school learning media module (field trial). The following are the results of the questionnaire.

Table 4. Lecturer and Student Responses to the Elementary School Learning Media Module

Respondent	Average Score	Percentage	Criteria
Lecturer	46,5	93	Good
Student	46,3	92,65	Good

According to Table 4, students scored 46.3 on average, while lecturers scored 46.5 on average. The learning media module for elementary school can therefore be said to have practical quality.

Discussion

According to the study's findings, the semester lesson plan's validation percentage was 100% and 96%, meeting the very deserving standards. The created module's Content Validity Ratio (CVR > 0) was likewise deemed valid. This indicates that the teaching materials have undergone the validation process and are considered suitable for use in elementary school learning media courses. The results demonstrate that the goals have been achieved and prove that in addition to offering instructional content, it is crucial to develop teaching resources that include students in real-world projects that encourage creativity and practical abilities (Dafit & Mustika, 2021; Manurung et al., 2023).

A number of factors are evaluated in order to determine the educational materials' validity. These factors include how well the teaching materials align with the content of the OBE-based *Merdeka* Curriculum, how well they align with learning objectives, and how well they align with the characteristics of the students. Overall, the assessment was positive, as the teaching materials supported project-oriented learning, in line with the demands of the OBE-based *Merdeka* Curriculum (Muis & Dewi, 2021; Muzakir, 2023). The material presented conformed to the structured learning objectives and supported student competency achievement. Every element of this instructional resource, from goals and content to evaluation, has been matched with quantifiable learning outcomes and complies with accepted criteria, making it legitimate. The incorporation of OBE guarantees that every learning component is focused on attaining certain competencies pertinent to business and community demands (Hasibuan et al., 2024; Apriana & Andalia, 2025). The PjBL emphasis, which mandates that students use knowledge in practical contexts rather than merely theoretical ones (Steffi & Syastra, 2015; Rehman et al., 2024), lends more credence to this validity. This demonstrates the necessity of this teaching material for both lecturers and students to learn.

Expert feedback also indicated that the module has an integrated chapter structure, activities, and evaluation instruments. The in-depth study of the material and assessment are project-oriented, ensuring transparency and measurability. This aligns with Nurhayati & Hariyanti (2019), who stated that the project-based learning approach provides the freedom to reflect on ideas and then solidify decision-making that impacts the project, the learning process, and demonstrate the final results or product. The use of project-based learning is in line with the OBE Curriculum's assessment requirements, which include authentic evaluations like projects, portfolios, and practical experience in addition to written tests (Fuadin & Fauziya, 2022).

Project-based teaching materials in the OBE-based *Merdeka* Curriculum allows students to play a proactive part in the educational process. Constructivist theory, which holds that learning is a dynamic process in which students actively participate in making sense of their experiences in addition to acquiring knowledge, is consistent with this (Wibowo et al., 2022; Tohari & Rahman, 2024; Suryana et al., 2022; Anjelita & Supriyanto, 2024; Pebrianti et al., 2015). Consistent with the results reported by Meti et al. (2021) the application of Outcome-Based Education (OBE)-oriented project-based learning (PjBL) effectively improves students' problem-solving competence, communication skills, and the development of complex higher-order thinking abilities. Therefore, the development of teaching materials for elementary school learning media courses oriented toward project-based learning within the OBE-based *Merdeka* Curriculum is highly relevant to supporting learning at universities, particularly in the study program.

Based on questionnaire results, the module received positive feedback, with a student response score of 92.65% and a lecturer response score of 93%. The module is useful for the learning process, according to both percentages. A number of factors, such as the content's appropriateness, presentation, and completeness, the display design, the module's advantages, its usability, learning motivation, the application of project-based learning, and the project's benefits, all demonstrate how practical media can be. Elementary school learning media is suitable for learning with a project-based approach. The existence of teaching materials, especially modules, can facilitate student mastery of the content and can provide direct experience in designing elementary school learning media so that the implementation of courses is not just theory. In today's learning, teaching materials that implement creative learning involving projects are needed, allowing students to work independently or in groups to build their knowledge and use it to create real products (Putriku et al., 2023; Setiawati et al., 2025). Furthermore, it was stated that teachers feel helped by the existence of project-based teaching materials because it makes learning easier. With the structure of the content, experimental activities, summaries, and evaluations within them, module as teaching materials are considered to improve learning abilities (Hardjo et al., 2018).

The experiment revealed that students were excited about participating in the learning process. This aligns with the findings of Nelson & Tarigan (2022), who discovered that students can actively engage in project-making activities using the processes outlined in project-based learning resources. Furthermore, lecturers, as instructors, also participate in managing classroom learning that involves project work. Developing project-based learning can enhance student creativity, increase learning activities, and improve the learning process (Panjaitan & Simangunsong, 2020; Arjaya et al., 2023; AS & Dalu, 2021; Sari et al. 2023; Novalia et al., 2025).

However, the practicality of this teaching material presents certain challenges. When applied in elementary school learning media courses, the module requires a relatively long duration because it emphasizes the process and stages of project implementation until the final learning media product is produced. Therefore, its use demands strong commitment from both lecturers and students to achieve the intended outcomes. Furthermore, this module may be less effective if implemented without a structured sequence or consistency, as each stage determines the success of the subsequent one. Hence, both lecturers and students need to maintain discipline and adherence to the planned stages throughout the learning process (Romadhon et al., 2023).

The practical implications of a module integrating project-based learning (PjBL), outcome-based education (OBE), and *Merdeka* Curriculum towards achieving learning objectives in the OBE curriculum are significant. This product serves as a bridge connecting OBE curriculum theory with relevant, student-centered teaching practices. This module forces a shift in focus. With a structured PjBL approach, instructors no longer simply "teach" the material but rather "facilitate" the students' process of achieving project outcomes (Muis & Dewi, 2021). Lecturers guide students through fundamental questions, project planning, and implementation, directly practicing the skills outlined in the learning outcomes. This module explicitly links each project stage to learning outcomes (Nisrina et al., 2021). For example, the project design stage could be designed to address the learning objectives on critical thinking, while the collaboration stage would address the learning objectives on teamwork. Thus, each activity has a clear objective in achieving the targeted competency. This module uses authentic assessment, where the product resulting from the project serves as evidence of learning outcomes. Furthermore, the reflection process in PjBL is also part of the assessment, allowing lecturers to gauge in-depth conceptual understanding, not just memorization (Fuadin & Fauziya, 2022). The final graduate profile completely satisfies the requirements of the OBE curriculum by giving them practical experience that equips them for the demands of the job. The OBE-based *Merdeka* Curriculum encourages students to innovate as a result of their learning through a flexible process and competency-based evaluation (Handayani & Zaim, 2023). Learning is not just about completing material but rather about what they do after learning (Gea & Koto, 2024). Effective learning is developed and learning activities are supported by the project-based learning method in the OBE-based *Merdeka* curriculum. For its execution, project-based modules are essential.

However, this study has several limitations. The development process was limited to the validation and practicality testing stages; therefore, the effectiveness of the developed module has not yet been tested through an experimental design. As a result, the study could not empirically determine the extent to which the module improves student learning outcomes compared to conventional instructional approaches. In addition, challenges related to authentic evaluation such as increased assessment workload for lecturers and the potential variability of results if applied in other study programs should also be acknowledged.

CONCLUSIONS

Conclusions

The needs of lecturers and students for project-based teaching materials in the elementary school learning media subject under the OBE-based *Merdeka* Curriculum are very specific, encompassing both practical guidance for students and structured flexibility for lecturers. The development of these materials followed a systematic framework based on the ADDIE model, ensuring alignment between measurable learning outcomes (OBE) and authentic, flexible project implementation through *Merdeka* Curriculum. Validation results indicated that the lesson plan achieved expert approval rates of 100% and 96%, while the module demonstrated high validity (CVR > 0). Furthermore, practicality assessments from lecturers and students reached 93% and 92.65%, respectively, confirming that the developed materials are practical and feasible for classroom use. The unique contribution of this study lies in the integration of project-based learning (PjBL), outcome-based education (OBE), and *Merdeka* Curriculum framework into a single, coherent instructional product for the elementary school learning media subject. This

integration provides a concrete model of how curriculum theory and practical project implementation can be harmonized in higher education settings. Theoretically, this study contributes to the development of a design model for teaching materials that operationalizes OBE principles through authentic, project-oriented learning activities. Practically, the module serves as an effective instructional resource that facilitates both lecturers and students in implementing competency-based, student-centered learning in line with the demands of 21st-century education.

Recommendations

For further research, consideration is given to analyzing the effectiveness of teaching materials, namely modules, to improve student's 21st century abilities like communication, cooperation, creativity, and critical thinking.

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