

Web-Based Media through Project Based Learning Approach to Support OBE Learning

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ABSTRACT

Outcome-Based Education (OBE) is an educational system oriented toward achieving measurable learning outcomes as the basis for planning, implementing, and evaluating learning. Implementing OBE in higher education requires learning innovations that can optimally support the achievement of graduate competencies. This research aims to develop web-based learning media through a Project-Based Learning (PjBL) approach and to test its feasibility and effectiveness in the Children's Fashion course. This study used a Research and Development (R&D) method with the ADDIE model, which consists of the stages of analysis, design, development, implementation, and evaluation. During the needs analysis phase, 92.5% of lecturers and 89.27% of students expressed a very high need for the development of web-based learning media. Product validation results showed that the assessment by material experts was 88.6% and the media experts 89%, both of which are in the very good category. User trials also showed positive results, with 81% of the small group, 85% of the medium group, and 87% of the large group, all in the good to excellent category. The effectiveness analysis showed that the average pretest score of 44.29 increased to 78.27 in the posttest. Furthermore, the N-Gain calculation was 0.61, which is in the moderate category. Based on these results, it can be concluded that the web-based learning media developed using the Project-Based Learning approach is feasible and quite effective in improving student learning outcomes in the Children's Fashion course and supporting the implementation of an OBE-based education system.



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INTRODUCTIONS

Vocational education is education that produces work-ready graduates who have skills according to the needs of the world of work (Vardina, et. al. 2019; Areisy, H. J., & Sudira, P. 2022; Mahmudah, F. N., & Santosa, B., 2021). This means that vocational education must be able to prepare graduates who have expertise competencies according to industry needs. This can be achieved by implementing the Outcome Based Education (OBE) learning model. Outcome-Based Education (OBE) has been implemented in higher education institutions in the world such as Australia and South Africa since 1990. Then the United States also implemented OBE in 1994. Outcome-Based Education (OBE) has become a recognized ideology in the field of education (Kumar, 2023).

Outcome-Based Education (OBE) OBE focuses on students as the primary focus, ensuring that all components of the education system are designed to achieve and demonstrate specific competencies that students must master after completing their education (Arifin, 2020; Hamidi et. al., 2024; Pham & Nguyen, 2024; Sunra et. al., 2024). The OBE approach assesses the achievement of learning outcomes and provides opportunities for students to develop the skills needed to prepare them for entering the workforce (Srivastava & Agnihotri, 2019). Every student should achieve learning objectives at the end of learning (outcomes) but still not forget the importance of the learning process in it (Purwaningsih, 2020). In the OBE concept, students play an active role in the learning process while lecturers only act as guides or facilitators (Mulawarman et al., 2020; Komsiyah, 2021; Su et al., 2021; Handayani, et al. 2024). The OBE system is expected to serve as an innovative approach to balance the acceleration of technological development with the enhancement of human resource capabilities and competitiveness (Wang, 2022). Currently, many universities in Indonesia have implemented the OBE curriculum. The implementation of OBE in Indonesia is driven by the increasing demand for graduates who are not only knowledgeable but also skilled in critical thinking, problem-solving, and collaboration (Khan Milon et al., 2024; Pham & Nguyen, 2024).

Medan State University is one of the universities that implements the OBE curriculum. To support the implementation of the OBE curriculum, the fashion design study program also utilizes technology, including the development of website-based learning media. A website is a learning tool that uses the internet network and provides all forms of information (Divayana, et al. 2016). Learning using a website is expected to be more enjoyable, because activities do not only take place in the classroom, but can also take place in virtual classes, e-learning (Herayanti, et al. 2017). Web-based learning can also help teachers prepare learning and as a tool for delivering difficult material. Websites can be used to display various information in the form of text, images, videos, audio, moving animations or a combination of all of them that are interrelated and connected by a network of pages or what can be called hyperlinks. Web-based learning has become an important way to improve learning and teaching, offering many learning opportunities (Hwang, et al. 2007). The use of the internet and websites has had a significant impact on the field of education. Website-based learning media provides flexibility in accessing learning materials anywhere and anytime, thus supporting independent learning and better understanding for students. The application of website-based learning media can create a dynamic, efficient, interactive, and more interesting learning atmosphere, thereby creating students' enthusiasm for learning (Azmi et al. 2020). The application of web-based media can be one of the learning media in children's fashion courses.

Children's fashion courses are one of the productive courses that provide students with the competence to make children's clothing. In line with the times, children's fashion models are increasingly diverse following fashion trends. In addition to following trends, the selection of children's clothing is certainly inseparable from the requirements of children's clothing itself, such as materials that easily absorb sweat, simple designs and bright colors (Al Syifa & Suliyanthini, 2021). Based on observations, Children's fashion courses are given to second semester students and some students come from high school so that students still have difficulty in learning children's fashion, especially breaking down children's fashion patterns according to the model. In addition, the limited time in learning activities also has an impact on students in completing assignments on campus. Students are also less active in

asking lecturers about material that is not yet understood. During learning, students tend to only see lecturers practicing how to break down children's fashion patterns and not infrequently when given assignments, students do not understand the learning because there is no media to help repeat learning at home. Learning communication using only oral language will not be able to help students understand abstract learning materials, equipment or media are needed that can help concretize abstract materials (Prior, et al. 2016; Richardson, 2003) and create an interesting learning atmosphere. Many students rely on the internet. This situation is found during class discussions, when lecturers give cases or assignments, students search more on the internet to answer questions (Jasrial, et al. 2022). This means that the internet can be used to consult on learning problems, give assignments, evaluate and create interactive service activities between students and teachers (Cholid et al., 2016). Therefore, the development of web-based media is considered capable of helping students in learning to break down children's fashion patterns. However, the development of web-based media must be accompanied by a learning approach that encourages student involvement in solving a problem.

Project Based Learning includes a student-centered approach and emphasizes everyday problems (sholihah, et al. 2022). Learning with Project based learning can improve the development of students' knowledge and skills (Ralph, 2015). Through PBL, it provides a holistic learning experience, supporting students in expanding critical and social skills that are very important for success in the real world. The use of the right method is very necessary to support the output achieved by students. Therefore, the development of web-based media is developed with a Project Based Learning model approach.

This web-based media is developed according to the student's environment which contains theories, images, learning videos, and learning evaluations. The material in it is in accordance with student development with themes in teaching materials that are very contextual and close to the student's environment. Each learning theme will be equipped with a learning evaluation in the form of problems that students must solve and then students must find solutions to break the pattern according to the children's fashion model. The Project Based Learning approach involves students in the construction of knowledge, asking them to complete meaningful projects and develop products (Brundiars & Wiek, 2013; Krajcik & Shin, 2014).

This study aims to develop web-based learning media through a project based learning approach in children's fashion courses to support OBE learning in the Fashion Education study program.

RESEARCH METHOD

This study uses the ADDIE development model. The ADDIE model uses a systems approach, namely dividing the learning planning process into several steps: Analysis, Design, Development, Implementation, and Evaluation (Januszewski & Molenda, 2008). The subjects of this research were second semester students of the Fashion Design Education study program.

Research and development procedures in research are used to produce certain products and determine the level of feasibility of developing Web Media in *Children's fashion Making*, namely: 1) Analysis (curriculum, student needs, and subjects); 2) Design (compile material, formulate storyboards, formulating the appearance of Web Blog pages, and compiling instrument grids); 3) Development (producing Web products, validating material

and media experts, improving materials and media); 4) Application (applying media to schools); and 5) Evaluation (test formative and summative).

The instrument used in this study is a questionnaire. The questionnaire used in this study was: 1) a questionnaire for analyzing student needs; 2) a questionnaire validator for material experts; and 3) a questionnaire validator for media experts to determine the feasibility of web blog media in making Children's fashion.

Measuring using a Likert scale that is used in measuring the attitudes and opinions of a person or group about social events. The answers to each item use a Likert scale ranging from positive (+) to negative (-), which can be in the form of words, and then these answers can be given a score. The following is the scoring of the instrument items in the study:

Table 1. Likert Scale Score

Answer	score
Strongly agree	5
Agree	4
Disagree	3
Don't agree	2
Strongly Disagree	1

Source: (Riduwan, 2016)

Media eligibility is obtained from the validation results for the validator. Feasibility of data in the form of quantitative data or numbers. then analyzed again with descriptive data. According to (Sugiyono, 2013), descriptive data is the calculation of data that is used as a description of the data that has been collected, which presents data in the form of tables, diagrams, calculations of mode, median, and presentation of percentages. The techniques used in analyzing the data are: the questionnaire was first validated by media and material validators; collecting data that has been filled into tables; and calculating the feasibility score of the student's questionnaire.

The final step concludes the calculation results based on aspects with the criteria in the table below, namely:

Table 2. Scoring category

No	Intervals	Category
1	81% - 100%	Strongly agree
2	61% - 80%	Agree
3	41% - 60%	Disagree
4	21% - 40%	Don't agree
5	0% - 20%	Strongly Disagree

Source: (Riduwan, 2016).

RESEARCH FINDINGS AND DISCUSSION

Research Findings

This research is an R&D research using the ADDIE development model. The ADDIE model consists of 5 stages, namely Analyze, Design, Development, Implementation, and Evaluation. At the analyze stage, observations, observations and interviews are carried out. Based on the results of observations, in the children's fashion course, students have many difficulties in making children's clothing, especially breaking down children's clothing patterns according to the model. In addition, limited time in learning activities also has an impact on

students in completing assignments on campus, especially since most students come from high school. Students are required to be able to make children's clothing that follows fashion trends and applies the requirements for children's clothing such as the use of materials that easily absorb sweat, simple designs and bright colors. According to observations made, many students also rely on the internet. This situation is found during discussions in class, when lecturers give cases or assignments, students search more on the internet to complete children's clothing assignments. However, the media available on the internet for children's clothing is still minimal.

based on the results of observations and observations made, an analysis of the needs of lecturers and students was carried out. The analysis of the needs of lecturers was carried out by 4 fashion lecturers who taught the children's fashion course. Student needs analysis was conducted by 32 students by distributing media needs questionnaires. The results of the needs analysis from the questionnaires that had been distributed obtained results of 92.5% of lecturers needing media. The results of the student needs analysis obtained 89.27% really needing media. From these data it can be concluded that Web-based Media through the Project Based Learning Approach in Children's Fashion Courses is very much needed to Support Obe Learning.

At the design stage, the initial media design and storyboard are carried out through two stages, namely First, determining the material that is in accordance with the competency requirements. Second, selecting and determining the software that will be used in media development. This first design stage is carried out: (1) Reviewing the Curriculum, carried out so that the development of web-based media through a project-based learning approach on children's fashion material is produced inseparable from learning objectives. (2) Identifying the materials needed for media development, including designing the initial product and material structure, collecting materials and evaluation. The second stage is developing web-based media with a project-based learning approach. This means that the media is developed by paying attention to the problems and projects that will be worked on in children's fashion. In this study, the main software used is Google Sites. Google Sites is one of Google's platforms for creating websites practically. In addition, the use of Canva, Corel Draw and Photoshop also helps to design images on the media.

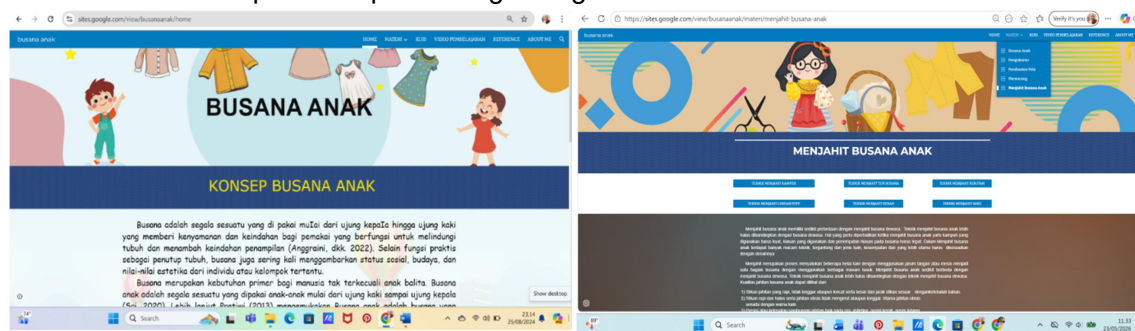


Figure 1. Web View

On the web page is equipped with home, materials, learning videos, quizzes, references and about me. The home display contains a brief explanation of the concept of children's fashion. The display of materials is equipped with children's fashion materials that have been adjusted to the learning objectives. In each chapter, the material is equipped with exercises that students must work on as a project to see how much students understand the

learning in each material given. In addition, on the web there is also a display of learning videos containing videos of making children's play clothes. The web page is also equipped with multiple-choice quizzes that must be worked on by students to see students' knowledge of children's fashion.

At the development stage, web-based learning media development was carried out. The results of this web-based media were then validated by material experts and media experts. Material experts consist of 2 experts in their fields. Media experts consist of 2 experts in the field of educational media. Validation of materials and media was carried out to determine the feasibility of web-based materials and media so that they can be used in children's fashion learning.

The results of the validation of material experts include learning aspects, material presentation aspects and linguistic aspects

Table 3. Results of Material Expert Assessment

Aspect	Average (Σ)	Percentage (P)
Learning	22,5	90%
Presentation of Material	26,5	88,33%
Linguistics	13	86,7%
Overall Percentage		88,6%

From the table above, it can be seen that the assessment of the two material experts on the learning aspect obtained 90% in the very good category. In the aspect of material presentation, it obtained 88.33% in the very good category, and in the linguistic aspect, it obtained 86.7% in the very good category. From these three aspects, the average assessment obtained 88.6% in the very good category. Suggestions from both materials in an effort to obtain material quality that is in accordance with the objectives and competencies are that the material must be limited so that it is not too much and focused, the material is clarified with additional images, the learning sequence must be in accordance with the concept map and clarify images and videos with tension. Based on the suggestions from the two material experts, it becomes the basis for improving web-based media. From the assessment of the two material experts, it shows that the material used in the media is appropriate and can be used in children's fashion learning.

Media Expert Validation was conducted by two learning media experts. Media validation was conducted to determine the feasibility of the web-based media that had been developed. The aspects assessed were the feasibility of media content, Media Presentation, and Media Usefulness.

Table 4. Media Expert Assessment Results

Aspect	Average (Σ)	Percentage (P)
Media content suitability	26,5	88,33%
Media presentation	22,5	90%
Usefulness	18	90%
Overall Percentage		89,5%

From the table above, it can be seen that the assessment of media experts on the aspect of media content feasibility obtained 88.33%, on the aspect of media presentation obtained 90% and on the aspect of media usefulness obtained 90%. The total results of the media expert assessment on average obtained 89.5% in the very good category. Some

suggestions from media experts such as adding several colors and children's characters to the web, the background is adjusted to the child's concept, and several layouts and writing must be in accordance with the characteristics of students. Suggestions from media experts are the basis for improvements to the media. The overall assessment results from media experts indicate that the media developed is suitable for use in children's fashion learning.

The implementation stage begins with the small group, medium group and large group trial stages. The small group trial was conducted by 9 students, the medium group trial was conducted by 18 students and the large group trial was conducted by 32 students. The results of the small group trial obtained 81% in the very good category, the medium group trial obtained 85% in the very good category and the large group trial obtained 87% in the very good category. Based on the results of the validation and media trials, it can be concluded that Web-based media through the project-based learning approach developed is very feasible to be used as a learning medium in children's fashion learning. The development of Web-based media can facilitate the delivery of material and students are more interested in repeating learning so that they can improve students' understanding of making the children fashion

Table 5. Results of small, medium, and large group tests on web-based media

No	Indicator	Small Scale	Medium Scale	Large Scale
1	Children's fashion material on web media is in accordance with learning objectives	35	80	152
2	The material is explained in detail and clearly.	39	82	154
3	The material on web-based media is easy to understand.	35	75	146
4	The image quality contained in web-based media is very clear.	33	73	140
5	Learning Videos help students in making children's clothing	38	76	140
6	The grammar used is easy to understand	33	72	135
7	Assignments on web-based media can help improve competence in making children's clothing.	37	72	134
8	Quizzes on web-based media can help improve children's fashion knowledge.	39	80	150
9	The use of WEB-based media helps students work on children's clothing making projects.	35	76	140
10	Media based media display is very attractive	40	86	157
11	Web-based media display motivates students to learn children's fashion	35	75	137
12	Web-based media can help independent learning easily	38	75	138
Total		437	922	1723
Percentage		81%	85%	87%

The results of the small group trial obtained 81% in the good category, the medium group trial obtained 85% in the good category, and the large group trial obtained 87% in the Very Good category. These trial results indicate that Web-based media through a project-based learning approach is suitable for use in children's fashion learning.

An effectiveness test was conducted to assess the effectiveness of web-based media through a project-based learning approach. The effectiveness test was conducted on 26 second- and even-semester students of the Fashion Design Study Program. The pre-test results for students obtained a lowest score of 29.86, a highest score of 56.72, mean 44.29 with a standard deviation of 6.9.

Table 6. Frequency Distribution of Students' Pretest Scores

Value Range	Frequency	Percentage
29 – 33	2	7.7
34 – 38	3	11.5
39 – 43	6	23.1
44 – 48	8	30.8
49 – 53	5	19.2
54 - 59	2	7.7
Total	26	100

Furthermore, the results of the post-test given to students who used web-based media through the project-based learning approach obtained the lowest score of 66.50, the highest score of 89.82, mean of 78.27 and the standard deviation of 5.43.

Table 7. Frequency Distribution of Pretest Scores of Students Who Were Taught Using Web-Based Media Through a Project-Based Learning Approach

Value Range	Frequency	Percentage
66 – 70	2	7.7
71 – 75	3	11.5
76 – 80	7	26.9
81 – 85	8	30.8
86 – 90	6	23.1
Total	26	100

Pretest and posttest results showed improved learning outcomes for students taught using web-based media through the Project-Based Learning approach. The average pretest score of 44.29 increased to 78.27 in the posttest. This indicates improved learning outcomes after implementing the developed learning media.

Furthermore, to determine the effectiveness of improving student learning outcomes after implementing web-based learning media through the Project-Based Learning approach, an N-Gain analysis was conducted. This analysis measures the magnitude of learning improvement based on the difference between pretest and posttest scores, taking into account the maximum possible score.

The calculation results show that the average pretest score of 44.29 increased to 78.27 in the posttest. The N-Gain calculation yielded a score of 0.61. This score falls within the moderate category, indicating that the developed web-based learning media has a moderate

level of effectiveness in improving student learning outcomes in the Children's Fashion course.

Therefore, it can be concluded that the use of web-based learning media through the Project-Based Learning approach has made a positive contribution to improving student learning outcomes. Although the improvement is still moderate, there is still room for further optimization in the development of the learning media.

Discussion

The paradigm shift in higher education demands a learning system oriented toward learning outcomes (Outcome-Based Education/OBE). OBE is a curriculum approach that emphasizes the systematically measurable achievement of graduate competencies, so that all learning activities are designed to achieve the desired graduate profile (Spady, 1994). In this context, the role of innovative and relevant learning media is crucial in supporting the achievement of learning outcomes.

The development of web-based media is a strategic solution to support the implementation of OBE. Web-based media allows flexibility of time and place, broad access to information, and multimedia integration, which can increase motivation and learning effectiveness (Suartama et al., 2020). Web-based learning also supports self-directed learning, a key principle of OBE.

The Project-Based Learning (PjBL) approach was chosen in developing this media because it has characteristics that align with the OBE principles, namely student-centered learning, oriented towards tangible results, and encouraging 21st-century skills such as critical thinking, collaboration, and communication (Thomas, 2000). In this context, the developed web-based media provides structured projects that students must complete to achieve certain learning outcomes.

This development research follows the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model, which allows for systematic, needs-based media development. In the analysis stage, the learning outcomes (CPL) that students must achieve in a specific course are identified. The results of this analysis serve as the basis for designing the project and features of the web-based media being developed. The initial stage of this research began with a needs analysis to identify the urgency of media development. The analysis showed that 92.5% of lecturers stated a strong need for web-based learning media to support effective learning, particularly in strengthening practice-based learning outcomes. Meanwhile, 89.27% of students also stated a strong need for interactive, flexible, and easily accessible learning media. These results align with research by Azmi et al. (2020), which found that digital-based learning media can increase student interest and understanding and support independent learning.

During the design phase, development was carried out using Google Sites as the primary platform for website creation. Google Sites was chosen based on its practicality, accessibility, and easy integration with Google accounts, making it highly suitable for use in higher education (Lestari & Nurdin, 2021). The interface design was created using graphics software such as Canva, CorelDRAW, and Adobe Photoshop to create engaging and educational illustrations and visual materials.

During the development stage, validation was conducted by material experts and media experts. The material expert validation obtained a score of 88.6%, categorized as very good. This indicates that the developed content aligns with the targeted competencies in children's fashion learning. It is important to deliver material on children's fashion systematically, as it is

closely related to the development of fashion design and the needs of the children's fashion market (Purwaningrum, 2019). The media expert validation gave a score of 89.5%, categorized as very good, indicating that the media's navigation, visual appearance, and functionality were optimal and user-friendly. This finding aligns with the opinion of Sutopo and Wahyudin (2020), who stated that good learning media must have an intuitive interface, attractive visuals, and easy access to increase the effectiveness of online learning.

Implementation stage, the media was tested on three user groups, namely the small group: obtained a score of 81% (good category), the medium group: obtained a score of 85% (good category), and the large group: obtained a score of 87% (very good category). These results indicate that the developed web-based media is very suitable for use as a project-based children's fashion learning tool.

The effectiveness of the media was also evident from the results of the students' pretest and posttest. The average pretest score was 44.29 and the average posttest score was 78.27. This data shows a 33.98-point increase, indicating a significant improvement in learning outcomes. Based on the N-Gain calculation, a value of 0.61 was obtained, which is considered moderate. This indicates that the developed web-based learning media is quite effective in improving student learning outcomes in the Children's Fashion course. These results are consistent with previous findings that a digital project-based learning approach can improve students' conceptual understanding and practical skills (Sari et al., 2021; Haryanto et al., 2022).

Several previous studies support the effectiveness of combining PjBL and web-based media in supporting OBE learning. For example, research by Haryanto et al. (2022) showed that web-based media designed with a project approach improved students' conceptual understanding and problem-solving skills. Another study by Putra and Susilo (2021) found that implementing PjBL in a digital environment encouraged active student engagement and significantly improved learning outcomes. The development of this media also adhered to Universal Design for Learning (UDL) principles to ensure accessibility for all students. Intuitive interface design, content accessibility across multiple devices, and a diversity of learning resources (text, video, and audio) were all key considerations in the development process.

Thus, the development of web-based learning media through a project-based learning approach has proven effective and relevant in supporting the implementation of OBE learning. This media serves not only as a learning aid but also as an active learning platform that fosters independence and creativity, and encourages the maximum achievement of graduate competencies

CONCLUSION

Based on the research results and discussion, it can be concluded that the web-based learning media developed using the Project-Based Learning (PjBL) approach within the Outcome-Based Education (OBE) framework is feasible and effective for use in Children's Fashion learning. This is demonstrated by the validation results from material experts (88.6%) and media experts (89%), which fall into the very good category. User trials also showed a positive response, with small group trials achieving 81%, medium group trials achieving 85%, and large group trials achieving 87%, all of which fall into the good to very good category. Furthermore, the effectiveness analysis showed an improvement in student learning outcomes, with an average pretest score of 44.29 increasing to 78.27 in the posttest. The N-Gain calculation of 0.61 falls into the moderate category, indicating that the web-based learning media is quite effective in improving student learning outcomes. Thus,

the developed media is not only technically and pedagogically feasible but also contributes positively to improving student learning outcomes in Children's Fashion learning.

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