Needs Analysis for Developing a PjBL-Based E-Module on Product Photography to Improve Digitalpreneur Competence

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Abstract

Background – Digital transformation in the Industry 4.0 era has elevated the importance of product visual literacy, especially in digital marketing strategies. Among MSME actors, the ability to produce compelling product photos is essential for enhancing digitalpreneurial competence.

Research Urgency – Despite this shift, the training processes at Balatkop Semarang remain conventional, with limited technology integration and inadequate instructional materials tailored to learners' needs. This creates a gap between current learning practices and the demands of digital entrepreneurship.

Research Objectives – This study aims to analyze the need for developing an e-module on product photography based on Project-Based Learning (PjBL) to enhance digitalpreneurship competence.

Research Method – A qualitative approach was used, employing triangulation through interviews, questionnaires, and observations involving 20 trainees and 2 facilitators.

Research Findings – The results show that 90% of participants expressed the need for digital teaching materials, while 95% preferred a project-based learning model. These findings indicate a strong demand for modern, contextual, and engaging learning resources that support practical skill development.

Research Conclusion – The PjBL-based e-module is a promising solution to address contemporary learning challenges. It promotes flexibility, contextual understanding, learner autonomy, and practical competence in product photography.

Research Novelty/Contribution – This study provides empirical insights into learner-centered instructional design for MSME training programs. It highlights the importance of aligning learning models with digital industry demands and supports innovation in digitalpreneurship education.

Keywords: e-module, Project Based Learning, digitalpreneur, product photography, MSMEs, needs analysis

Recommended citation:

INTRODUCTION

The era of the Industrial Revolution 4.0 is marked by profound digital transformation, affecting various aspects of life, including the economic system. Industry 4.0 presents a higher level of complexity, characterized by the integration of more advanced and connected technologies (Internet of Things – IoT). The development of Industry 4.0 marks the evolution of Industry 3.0, which focuses more on the automation of information and communication systems. The ability to meet the needs of modern society by utilizing increasingly sophisticated technology is the main characteristic of this era. The integration of information and communication technology (ICT) has created a new paradigm in business activities, especially in marketing strategies. Businesses, both small and large-scale, now use digital media as the main channel to promote their products and services, in order to achieve optimal efficiency and market reach. The implementation of digital marketing strategies has been proven to result in faster and consistent sales increases compared to conventional marketing approaches (Simj et al., 2024). This represents a significant shift from traditional marketing methods that are limited and less efficient.

Seeing the dynamics of the competitive e-commerce market, the need for qualified digital competencies for online business people is increasingly crucial The emergence of Industry 4.0 has given birth to a new digital-based profession, namely digitalpreneur. The existence of digitalpreneurs marks a transformation of the work landscape, where digital skills are a crucial asset in the global economic competition. The rapid growth of digitalpreneurs shows a dynamic adaptation to technological changes and ever-evolving market needs. Projected data shows significant growth in the e-commerce sector in Indonesia, with an increase of 51.03% expected between 2024 and 2029, indicating the dynamics of the development of the digital sector (Statista, 2024). The utilization of integrated digital platforms accelerates the process of internationalization and innovation, allowing companies to participate effectively in the global business ecosystem (Petersen & Rasmussen, 2024).

This phenomenon also reflects the shift from conventional business models to business models that are integrated with digital platforms. One of the tangible manifestations of this transformation is the adoption of e-marketing as a key marketing strategy, which allows for faster, more transparent, and efficient access to product information for consumers, compared to traditional marketing methods that rely on face-to-face or word-of-mouth interactions. Success in taking advantage of opportunities in this digital era requires the mastery of specific competencies. Product photography competence is a crucial element that is often a differentiating factor in the success of a digital business. These skills include professional product shooting techniques, the use of image editing software for visual optimization, and effective product photo presentation strategies on social media platforms.

Digitalpreneurs, especially in the MSME sector, face various challenges in developing digital competencies, especially in terms of product photography. Limited access to formal training, resources, and adequate technology is often a major barrier. The lack of knowledge about professional product photography techniques, the use of image editing software, and visual marketing strategies in digital media are also significant obstacles. As a result, their products are often less attractive and competitive in the online market. High-quality product photography has proven to contribute significantly to increased sales and product competitiveness. High-quality product photography has an important role in increasing product sales, especially in the MSME sector. The use of professional product photos is able to increase the attractiveness of the product and build consumer trust. Good product photos not only increase sales numbers but also help create a strong brand identity in the digital market(Prabowo, 2024) Increase competitiveness(Furqorina et al., 2023) products with better photo quality tend to be

more in demand by consumers compared to products displayed with low-quality photos (Lip Son & Deli, 2023).

Capable capabilities in product photography allow digitalpreneurs to create a strong and compelling brand image for consumers. The importance of developing photography skills and digitalpreneur competencies is not in line with the current learning situation. One of the problems faced, especially digitalpreneurs in Balatkop Semarang. Based on the results of problem analysis and interviews with employees at Balatkop, students still face obstacles in making attractive and quality product photos to support their digital marketing strategies. One of the factors causing this is the limited access to interactive and contextual teaching materials related to product photography. Product marketing strategies still rely on traditional methods, namely individual communication through WhatsApp supported by simple visual displays. The learning methods used tend to be conventional, less interactive, and not fully practice-based, so they are not able to optimize students' skills in the field of digitalpreneurship.

After the pretest, the average results of participants showed 30.8. therefore, it is necessary to develop a product photography e-module based on Project-Based Learning (PJBL) that allows students to learn actively, collaboratively, and based on real projects. The PJBL model is expected to improve participants' skills in applying product photography techniques effectively so that they are able to produce high-quality visual content that can increase their business competitiveness in the digital realm. The development of this e-module is an innovative solution to improve the competence of digitalpreneurs, support more flexible learning, and adapt to the needs of a market that increasingly relies on digital media in marketing activities. PJBL-based e-modules offer innovative solutions. The project-based learning approach offers numerous practical advantages for students, particularly in supporting documentation processes and fostering systematic thinking (Haryanto,et al 2024; Cuong & Tuan, 2021). E-modules provide high accessibility and flexibility of learning, according to the busyness and time constraints of digitalpreneurs. The PJBL model allows learners to learn through hands-on experience, develop problem-solving skills, and improve conceptual understanding through real-world projects.

METHOD

This study uses a descriptive qualitative approach with the aim of analyzing the need for the development of Project Based Learning (PjBL)-based product photography e-modules in improving digitalpreneur competence. This approach was chosen because it allows researchers to understand phenomena in depth in a natural context and based on the perspective of the participants (Moleong, 2017). Qualitative research is holistic, contextual, and focuses on meaning, experience, and social interaction that cannot be quantitatively measured (Creswell, 2015). Researchers play a key role as a key instrument in data collection and interpretation, which is an important characteristic of qualitative approaches. To maintain the objectivity and validity of the data, data triangulation techniques are used through interviews, questionnaires, and observations (Sugiyono, 2019).

The subjects in this study consisted of 20 trainees and 2 facilitators at the Cooperative Training Center (Balatkop) of Central Java Province. Data collection was carried out through semi-structured interviews, to dig up in-depth information about the participants' experiences and needs (Patton, 2002). Closed questionnaire, to obtain simple quantitative data related to participants' perceptions and preferences towards teaching media. Participatory observation, to see firsthand the learning conditions and learning behavior of participants in the context of training. The data obtained were analyzed using

interactive analysis techniques from Miles & Huberman (1994), which included three main stages: data reduction, data presentation, and conclusion/verification. Data reduction is carried out by sorting out important information from the results of interviews, questionnaires, and observations. The presentation of data is arranged in the form of narratives, tables, and graphs to facilitate interpretation. Conclusions are drawn inductively, while still referring to the theory and context of the field.).

RESULTS AND DISCUSSION

The purpose of needs analysis is to collect information related to potential problems that can arise in the learning process of product photos, learning implementation and obstacles found during learning activities. The results of the analysis obtained through interviews with facilitators at Balatkop Central Java, produced the following information.

Research Data Description

Table 1: Interview Results

Interview Results
The use of learning media is still limited, which shows that the learning facilities or tools used have not varied or are not optimal.
Still using conventional methods, indicating that the approach used in teaching tends to be traditional and less interactive
The need for innovation in learning, which indicates an urgent need to present new approaches that are more creative and relevant to the times.

The results of the interview with the facilitator are as shown in table 1. The facilitator found that in the learning process, learning media still tends to rely on conventional teaching materials in the form of print media, such as the Student Worksheet (LKPD), which only contains material summaries and evaluative questions. The lack of variety of media causes a low interest of students in learning materials, as well as a lack of stimulation for individual learning interests and needs. Therefore, teaching materials that are restructured are needed so that they can be adjusted to the needs of the participants. Differentiating in teaching materials in the learning implementation process is defined as an effort to adjust the use of teaching materials in the learning process in the classroom to meet the individual learning needs of each student (Febrianti et al., 2024). These needs are associated with each student's individual learning abilities and interests. Second, the learning process is still dominated by conventional approaches, where facilitators play the role of the only source of information. This teacher-centered learning strategy has not been able to provide a space for active participation for students, and it does not utilize technology and adaptive digital-based learning media. The use of technology-based interactive learning media significantly increases students' motivation and active participation compared to conventional methods(Rangkuti et al., 2024).

Third, facilitators found that learning is less innovative in facing challenges in the current era, so innovation is needed. Innovation in learning, which indicates an urgent need to present new approaches that are more creative and relevant to the times. The use of online learning platforms such as SPADA enhances students' creativity through interactive modules, collaborative forums, and multimedia resources — flexible and relevant to 21st-century digital needs(Iswandi, 2025). The next analysis related to the questionnaire distributed to the trainees consisted of the use of teaching materials in product photo learning. Based on the results of the analysis of the distribution of questionnaires to 20 participants, there were as many as 55% (11) of students who answered that sometimes they were enthusiastic in studying product photos, as seen in Figure 1.
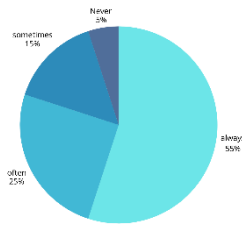
Figure 1. Percentage enthusiastic in studying product photos

Based on the results of the distribution of the questionnaire to 20 participants, it can be seen that 55% (11 students) gave an answer "always" (always enthusiastic) in studying product photos. This shows that most of the participants have a good interest and motivation towards learning product photos. Furthermore, 25% (5 students) answered "often", which means they show enthusiasm in the learning process quite often, although not all the time. In contrast, 15% (3 students) stated that they were "sometimes" excited, indicating that their enthusiasm for learning was fluctuating, possibly influenced by external factors such as learning methods or material difficulties. Finally, 5% (1 student) chose "never", which indicates the need for special attention to increase their motivation, for example through the provision of more engaging and relevant teaching materials. Mustova's research (2022) proves that the participatory use of photographic image media is able to increase student motivation and learning outcomes.

This is in line with the findings of Farizi, Rusyati, Sriwulan, and Hakim (2023) that 2D visual teaching media is able to increase students' interest and motivation to learn. Furthermore, Yudianto and Rahmat (2023) developed a digital photography teaching module that is considered valid, practical, and effective for learning, while Alfasha, Novriyanti, Eldarni, and Kurnia (2024) also produced a photography e-module for vocational school students with a high level of validity and practicality. Not only that, Anyan, Setyawan, and Suryani (2024) prove that the use of Quizizz-based interactive media can increase students' learning motivation through learning gamification. By integrating visual-based product photo e-modules, real photography media, as well as interactive elements such as quizzes, the opportunity to increase the learning spirit of trainees becomes greater. As many as 50% of participants answered that they sometimes actively participated in product photo learning. Seen in figure 2.
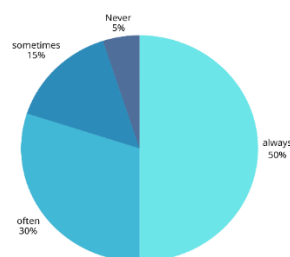

Figure 2. Percentage participated in product photo learning

Figure 2 shows a pie chart depicting the participant's level of active participation in product photo learning. A total of 50% (10 participants) stated always (always) actively participated, followed by 30% (6 participants) who answered often, 15% (3 participants) who answered sometimes, and 5% (1 participant) who stated never (never). This data indicates that most participants have a high engagement in product photo learning, although there are still about 20% whose participation is fluctuating or low. According to Mustova (2022), photographic image media can increase student motivation and learning outcomes, thereby supporting active participation. Alfasha, Novriyanti, Eldarni, and Kurnia (2024) also prove that attractively designed photography e-modules can make it easier for students to understand the material and encourage engagement. Similar things were expressed by Gunawan, Nursetyo, and Kustandi (2024), that the application of Project Based Learning (PjBL) in online

photography courses effectively increases engagement because participants are faced with real projects. The findings of Quthrunnada and Camelia (2024) on extracurricular product photography show that the PjBL approach motivates students to actively participate. In addition, research by Handina, Kasmawati, and Parisu (2025) proves that the use of Quizizz-based digital quizzes can increase students' enthusiasm and active participation. Therefore, the integration of visual teaching materials, PjBL, and interactive media is estimated to be able to maintain and even increase the proportion of participants who are always active in learning product photos. As many as 85% of participants felt that understanding product photos was a difficult challenge. Seen in Figure 3
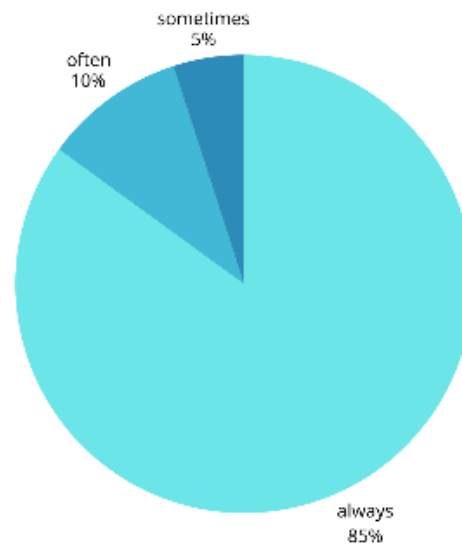

Figure 3. Percentage participants felt that understanding product photos was a difficult challenge

Several studies show that understanding product photos in the context of e-commerce is a significant challenge, both from technical, psychological, and perceptual aspects. Maier (2019) revealed that visual inconsistencies such as differences in background and orientation in product photos can reduce the fluency processing of visual information, which has an impact on decreasing customer satisfaction by up to 19%. Buana, Fardinal, and Tarmidi (2023) highlight the importance of visual clarity and transparency in product photos, considering that image ambiguity can mislead consumer' perception. Meanwhile, Kwon et al. (2024) found that the use of three-dimensional images is more effective in conveying the perception of product size than two-dimensional, which often fails to provide a real representation. Research by Szulc and Musielak (2020) shows that photographic elements such as lighting and backgrounds greatly influence the perception of accuracy of product details. Cardoso and Sissi (2021) also affirm that more than 60% of consumers are strongly influenced by visual quality in making purchasing decisions. Similar things are confirmed by Mokobombang and Kusumawati (2023), who found that image quality significantly affects usability perception, trust, and purchase intent. From all these findings, it can be concluded that the understanding of product photos is not only a technical issue, but is closely related to consumer perception and experience, thus demanding a more standardized and informative visual approach in digital marketing practices

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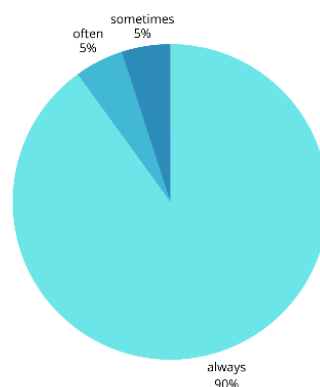

Figure 4. Percentage of participants need teaching materials in electronic form

This is due to the fact that students have become accustomed to using technology such as mobile phones and laptops in their daily lives. The presence of teaching materials in electronic format allows students to access materials flexibly and independently in various places. This data shows the high adoption and reliance on e-learning resources among product photo trainees. This is in line with field observations that participants are now accustomed to using mobile phones and laptops in daily activities; As a result, they expect learning materials that are mobile-accessible, flexible, and self-contained, anytime and anywhere. This trend is supported by the findings of Alfasha, Novriyanti, Eldarni, and Kurnia (2024) who developed photography e-modules for vocational schools and reported high levels of validity and practicality, indicating that the digital format helps students' readiness for independent learning. In the context of higher education, the development of an online course based on Project Based Learning (PjBL) for the Educational Photography course by Gunawan, Nursetyo, and Kustandi (2024) shows that a directed digital learning structure can facilitate remote access as well as applied project activities.

In terms of increasing learning engagement through digital platforms, research by Handina, Kasmawati, and Parisu (2025) shows that the use of Quizizz-based media is able to increase student engagement because it is interactive and easily accessible through gadgets. Meanwhile, the Mustova study (2022) confirms that the use of photographic image media increases learning motivation; When this kind of content is packaged in an easily accessible electronic format, the potential impact on

engagement will be greater. In the direct realm of product photography, Quthrunnada and Camelia (2024) show that the application of PjBL to product photography extracurricular activities encourages active student participation through real-world project work—something that can be strengthened by the distribution of digital guides, rubrics, and examples. Overall, the combination of structured e-modules, real-life task-based projects, visual-rich photographic content, and interactive digital activities has the potential to meet (and utilize) the needs of 90% of participants who want electronic teaching materials. analysis which showed that all respondents (100%) stated the need for learning materials that can be used independently, and can be accessed anytime and anywhere according to their learning needs. Seen in Figure 5
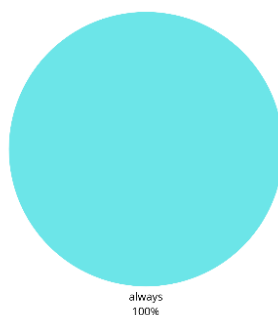

Figure 5. Percentage access materials flexibly and independently in various places

E-modules are a form of digital teaching materials that are designed to be learned independently by students. The main feature of e-modules is to encourage the principle of learning independence, as stated by Lasmiyati and Harta (2014). Self-learning independence is an active approach that requires the involvement of students in developing their potential autonomously, without relying on the presence of teachers, direct interaction in the classroom, or the presence of peers. Furthermore, the data results show that as many as 95% of students need project-based teaching materials to help improve their understanding of the concepts learned. Seen in figure 6.
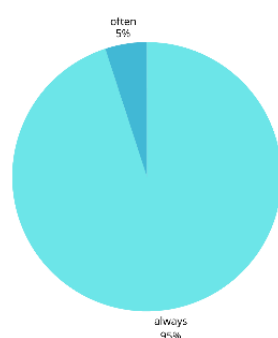

Figure 6. Percentage students need project-based teaching materials

Project-based learning (PjBL) is an educational approach that emphasizes students' active involvement through projects that integrate real-world challenges. The development of teaching materials based on PjBL has been shown to improve a variety of skills, including scientific creativity, collaboration, and procedural writing. This approach has been validated and practical in various subjects and levels of education, as evidenced by several studies. Teaching materials developed through the Project Based Learning (PjBL) model have shown high validity, effectiveness, and practicality. For example, the development of PjBL-based teaching materials on the topic of light diffraction that is

oriented towards increasing scientific creativity and collaboration has proven to be valid and practical, and has received positive responses from educators and students (Ambara et al., 2023).

Based on the results of needs analysis, questionnaires, and literature reviews, it can be emphasized that product photo learning requires innovation in the form of teaching materials that are more varied, modern, and adaptive to technological developments. The findings that the majority of participants showed high interest, motivation, and need for e-modules and project-based approaches confirmed that conventional learning models are no longer effective enough to support optimal learning engagement. The use of digital teaching materials, especially e-modules equipped with visual, interactive, and Project Based Learning (PjBL)-based content, has been proven to be able to increase active participation and motivation of students (Mustova, 2022; Alfasha et al., 2024; Gunawan et al., 2024), but also supports learning independence as shown in the questionnaire data. Thus, the integration of PjBL-based product photo e-modules is a strategic solution to overcome learning challenges, meet the needs of the majority of participants, and encourage the achievement of digitalpreneur competencies effectively and sustainably.

CONCLUSION

The Industrial Revolution 4.0 era has brought significant digital transformation, affecting economic systems and business patterns, including in marketing practices. The integration of information and communication technology encourages business actors to adopt digital marketing strategies to increase competitiveness. In this context, digitalpreneurs are the main actors in optimizing e-commerce opportunities, especially through the visual capabilities of products such as photography. However, MSME actors, including trainees at Balatkop Semarang, still face challenges in terms of digital competence, especially product photography, due to the limitations of relevant teaching materials, access to training, and the use of conventional learning methods that are less interactive.

The results of the analysis showed the low enthusiasm and participation of participants in learning product photography, as well as the high need for contextual, flexible, and project-based digital teaching materials. Project-Based Learning (PjBL) is a relevant approach to answer these needs, because it has proven to be effective in improving practical, collaborative, and problem-solving skills. Therefore, the development of PjBL-based product photography e-modules is an innovative solution to improve digitalpreneur competence, support independent learning, and encourage digital business competitiveness in a sustainable manner.

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