

## Enhancing Learning Outcomes and Motivation in Vocational High School Students through Canvasites Learning Media Development

Hanifah Agustin <sup>1\*</sup>, Herman Saputro <sup>2</sup>, Abdul Haris Setiawan <sup>3</sup>

<sup>1</sup> Universitas Sebelas Maret, Surakarta, Indonesia; [hanifahagustin48@student.uns.ac.id](mailto:hanifahagustin48@student.uns.ac.id)

<sup>2</sup> Universitas Sebelas Maret, Surakarta, Indonesia; [hermansaputro@staff.uns.ac.id](mailto:hermansaputro@staff.uns.ac.id)

<sup>3</sup> Universitas Sebelas Maret, Surakarta, Indonesia; [aharis@staff.uns.ac.id](mailto:aharis@staff.uns.ac.id)

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### ABSTRACT

Effective learning media can enhance students' motivation and academic outcomes. This study aims to develop and evaluate interactive learning media based on Canvasites, assessing its effectiveness in improving student motivation and learning performance. A mixed-method approach combining Research and Development (R&D) with experimental research was used. The ADDIE model guided media development through five stages: analysis, design, development, implementation, and evaluation. Data were collected through questionnaires, pretest-posttest assessments, and interviews. Descriptive analysis, feasibility criteria scoring, and statistical tests (Independent Samples Test and N-Gain) were used to evaluate effectiveness. Findings indicate that Canvasites-based interactive learning media is a viable solution for addressing learning challenges. The effectiveness test showed a significant improvement in student motivation, with experimental group participants expressing greater enthusiasm and engagement. Statistical results confirmed a significant difference (Sig. < 0.05) in learning outcomes between pre- and post-intervention, with the experimental group outperforming the control group. The hypothesis test rejected  $H_0$ , confirming that the experimental group achieved higher mean scores. Additionally, N-Gain analysis classified the experimental group's learning improvement as "Moderately Effective" (0.1571) compared to the control group (0.0324). These findings suggest that Canvasites-based interactive media enhances both student motivation and academic performance. The structured ADDIE development approach ensures effective implementation in educational settings. Canvasites-based interactive learning media is an effective tool for increasing student motivation and learning outcomes. Future research should explore its broader application across diverse subjects and educational levels.

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### Corresponding Author:

Hanifah Agustin

Universitas Sebelas Maret, Surakarta, Indonesia; [hanifahagustin48@student.uns.ac.id](mailto:hanifahagustin48@student.uns.ac.id)

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## 1. INTRODUCTION

In today's modern society, technology plays an increasingly dominant role in everyday life, including education. The rapid evolution of digital tools has significantly influenced teaching and learning practices. In response to these changes, blended learning has emerged as a widely adopted approach in higher education institutions worldwide (Lee et al., 2017, p. 448). As the frontline of Indonesia's education system, teachers are responsible for preparing students by fostering knowledge, skills, attitudes, and values of Pancasila. The integration of audiovisual media in education has become essential, as it enables students to engage with learning materials in a more interactive and effective manner (Luetkemeyer, 2017, p. 72).

According to Van Dallen's theory, six key factors significantly impact student learning outcomes: the educator's role, curriculum structure, learner characteristics, learning media, teaching methods, and the learning environment (Sutrisno & Siswanto, 2016, p. 111). Among these, the selection and application of appropriate learning media play a crucial role in enhancing student engagement and comprehension. The National Council for Social Studies (2017) highlights the importance of developing audiovisual materials for vocational education to meet the needs of today's digitally inclined students.

In the digital age, learners require fast, accurate, and easily accessible information. A study in the United States found that 97% of adolescents aged 12-18 are active internet users and engage in online gaming (Brad et al., 2015, p. 33). This phenomenon suggests that integrating internet-based audiovisual media and online gaming elements in secondary education can enhance learning by making it more contextual and relevant to students. Learning media is a crucial component of interactive education; therefore, continuous innovation is necessary to ensure that learning tools effectively support instructional objectives (Haryadi et al., 2021).

Observations at SMK Negeri 1 Kebonsari indicate that teachers predominantly rely on conventional teaching methods, which often result in student disengagement and limited knowledge retention (Wibowo & Koerniawan, 2022, p. 94). To address this issue, researchers aim to develop interactive learning media based on Canvasites and assess its impact on student motivation and learning outcomes. In the era of Education 4.0, educators must adapt to technological advancements to enhance the effectiveness of teaching. This study seeks to develop Canvasites-based interactive learning media and evaluate its effectiveness in improving student engagement, motivation, and academic performance.

Research and Development (R&D) is a systematic process used to develop educational tools through iterative research cycles incorporating various methodologies (Bahtiar, 2022). One widely used framework for instructional design is the ADDIE model, which provides a structured, flexible, and dynamic approach to educational media development (Magdalena et al., 2020). The ADDIE model consists of five key stages: (1) Analysis, which includes diagnostic assessment to identify challenges and student needs; (2) Design, where learning objectives, instructional plans, and resources are determined; (3) Development, which involves creating learning media tailored to the curriculum; (4) Implementation, where the media is tested in both control and experimental groups; and (5) Evaluation, which assesses the effectiveness and feasibility of the developed media (Hidayat & Nizar, 2021). This systematic approach ensures that the media aligns with learning goals and enhances student engagement and outcomes (Cahyadi, 2019, p. 39).

Interactive media combines audiovisual elements with interactive components, such as selection buttons, quizzes, and external links, to enhance engagement and learning outcomes (Indra et al., 2021, p. 20). Studies indicate that the use of interactive media significantly improves student comprehension and motivation, particularly in vocational education, where practical skill application is essential (Robbia & Fuadi, 2020, p. 121). The purpose of interactive media is not only to deliver content but also to foster student interaction and engagement with the material (Arief et al., 2019, p. 89).

Canva, a widely used online platform, offers an accessible and customizable tool for educators to design engaging learning materials (Ariningsih et al., 2022). It provides a variety of features, including templates, animations, icons, and video elements, that allow teachers to create visually appealing instructional media without requiring advanced technical skills (Wulandari & Mudinillah, 2022, p. 115).

Additionally, Canva facilitates knowledge sharing between educators and students, creating a collaborative learning environment. The development of Canvasites-based learning media involves designing a storyboard, structuring the visual layout, and integrating multimedia elements such as images, animations, and background visuals directly within Canva's platform. This process ensures that the final product is engaging and visually stimulating, reducing student boredom and enhancing comprehension.

This study focuses on the development and evaluation of Canvasites-based interactive learning media to examine its effect on student motivation and learning outcomes in the Creative Products & Entrepreneurship (PKWU) subject at SMK. The ultimate goal is to align learning outcomes with the Merdeka Curriculum, ensuring students develop a deep understanding of packaging and labeling product design.

Learning outcomes in vocational education reflect students' success in mastering subject material, often measured through assessment scores. One key factor influencing academic performance is learning motivation, which drives students to engage in learning activities and strive for academic success. High motivation is associated with better learning outcomes, while low motivation often results in poor academic performance.

This study proposes the following hypothesis:

- $H_a$ : The development of Canvasites-based interactive learning media significantly enhances student motivation and learning outcomes.
- $H_0$ : The development of Canvasites-based interactive learning media does not significantly impact student motivation and learning outcomes.

Through experimental testing, this research aims to validate the effectiveness of Canvasites-based learning media as an innovative educational tool in vocational learning contexts.

## 2. METHODS

This study employs a mixed-method approach, combining Research and Development (R&D) with experimental research. The R&D approach is used to conduct a needs analysis and develop Canvasites-based interactive learning media, while the experimental research assesses its effectiveness in improving student motivation and learning outcomes. According to Sugiyono (2011, p. 297), research is necessary not only for product development but also for testing its effectiveness to ensure broader applicability in educational settings.

The product validation process is conducted by expert validators to ensure the feasibility and effectiveness of the developed learning media. This validation involves assessments from ICT multimedia experts, vocational practitioners, and subject matter experts, each evaluating the product's alignment with student needs, content accuracy, and practical applicability.

The study follows the ADDIE model—a structured instructional design framework consisting of Analysis, Design, Development, Implementation, and Evaluation—to guide the development and assessment of the interactive learning media. To test its effectiveness, experimental research is conducted on Grade XI TKJ (Computer and Network Engineering) students from three vocational schools:

- SMKN 1 Kebonsari
- SMKN 1 Geger
- SMK Muhammadiyah 3 Dolopo

Each school includes one experimental class using the Canvasites-based interactive learning media and one control class using conventional teaching methods. The results from both groups are analyzed to determine the impact of the developed media on student motivation and learning outcomes.

**Table 1.** Experimental product test design

Class	Pretest	Treatment	Posttest
Control	O <sub>1</sub>		O <sub>2</sub>
Experiment	O <sub>3</sub>	X	O <sub>4</sub>

To evaluate the effectiveness of the developed learning media, questionnaires and interviews were conducted with respondents. The experimental testing focused on two key variables: student motivation and learning outcomes. Motivation levels were assessed using questionnaires, while learning outcomes were measured through knowledge-based tests on the instructional material. The collected data was then analyzed using SPSS to ensure accurate statistical evaluation and interpretation of the findings.

### 3. FINDINGS AND DISCUSSION

#### 3.1 Product Development

This research and development project resulted in the creation of a website-based multimedia learning platform that is directly integrated with Canva (<https://www.canva.com/settings/your-account>). The platform is accessible across multiple devices, including computers, laptops, and smartphones, making it a versatile tool for both classroom and remote learning.

The developed platform, Canvasites, is designed to enhance the learning experience by incorporating key instructional elements such as Learning Outcomes (LOt), Learning Objectives (LOj), Flow of Learning Objectives (FLO), and multimedia-based learning materials. These materials include learning videos, adapted from student textbooks, and various interactive features that allow learners to engage with content in a way that suits their individual learning preferences. Students can choose from multiple learning modes, such as reading the material, summarizing key concepts, or watching instructional videos to reinforce their understanding.

The multimedia editing process is conducted using Canva, ensuring visually appealing and interactive content. The development of this learning media follows the ADDIE model, which consists of Analysis, Design, Development, Implementation, and Evaluation stages, ensuring a systematic approach to instructional design and continuous improvement of the platform.

##### 3.1.1 Analyze

Based on data collection (questionnaires and interviews) to answer learning media needs analysis, learning technology analysis, learner character analysis, and curriculum analysis; researchers can conclude that interactive learning media based on Canvasites in the industrial era 4.0 and digitalization of all lines of life, learning styles and digital skills of today's youth, it is very necessary to develop an Interactive learning media to support Merdeka Belajar which is wrapped in the inevitability of digitalization transformation in school learning.

##### 3.1.2 Design

The design and development of the product align with the initially created storyboard, ensuring consistency in structure and visual presentation. The development process involves preparing essential materials, including backgrounds optimized for smartphone screens, supporting images, subject content, instructional videos, animated cartoons, and assessment instruments. These elements are sourced from the internet and Canvasites and are tailored to meet the specific needs of the product.

For optimal performance, the learning media requires a minimum computer specification of a Core i3 processor, 4GB RAM, 256GB SSD, and a 4GB VGA card, with the Windows 10 operating system being used during development. The Canva for Education platform serves as the primary tool for creating interactive learning media. To access and utilize its features, users must first register for a Canvasites account by signing in with a personal email account.

### 3.1.3 Development

From the observation of each component by practitioners/PKWU subject teachers, the data shows that the Canvasite-based learning media developed by researchers is suitable for use, with a note to recommend that the requirements for evaluating learning media be improved again before the experimental test process. Product validation is carried out by validators who are experts in their fields. Validation of multimedia ICT experts, vocational practitioner experts, and material experts is carried out by each who has competence in their field and validated to provide recommendations that Canvasites interactive learning media products after improvements are recommended to be very feasible to use.

### 3.1.4 Implementation

In the implementation stage, the researchers implemented it in the class where the researchers taught PKWU subjects in the even semester of the 2023/2024 academic year and to a class of colleagues who were members of the TKJ Teacher MGMP forum, namely at SMK Negeri 1 Geger and SMK Muhammadiyah 3 Dolopo to determine the practicality and interest of students in the Canvasites learning media developed.

The purpose of conducting a large group trial is to find out whether the learning media products that researchers develop can be used on a wider learning scale and strengthen their validity. The results of the large group trial showed that students were able to smoothly utilize the products that had been developed and showed high interest in learning activities when using interactive multimedia in the learning process.

### 3.1.5 Evaluation

Evaluation and revision are carried out at each stage of development so that the Canvasites-based learning media developed can be considered valid and have high validity. Researchers make improvements to each process and stage so that the products that researchers develop can be used comprehensively for grade XI SMK students. Based on the results of interviews with students after conducting small group trials and filling out student response questionnaires, it can be concluded that the Canvasites learning media development product used during PKWU learning on Product Packaging Design and Labelling material is proven to make the learning atmosphere very enjoyable and able to motivate students in learning the material and this is what is expected of the spirit of Merdeka Learning in the Merdeka Curriculum.

Based on the results of the needs analysis, the development of interactive multimedia products based on Canvasites is considered as one of the solutions in solving learning problems. Before being applied for learning activities, this Canvasites-based interactive multimedia product is first validated both theoretically and practically so that there is a feedback process to improve product quality both theoretically and practically in order to get a feasibility predicate as a multimedia product that is suitable for the learning process that has an impact on students.

The implementation of the Merdeka Curriculum provides a large space for digital information technology to be integrated into the learning process, one form of integration can be done by using interactive learning media that attracts students who are now in the Gen Z era, one of whose behaviors is familiar and capable with information technology devices and likes something easy and practical. The development of interactive multimedia based on Canvasites is based on the results of the needs analysis and the integration of the use of digital technology in the learning process as stated in the curriculum implementation.

Looking from the point of view of educational technology, the Association for Educational Communications Technology (AECT) reveals the definition of educational technology that educational technology is the theory and ethical practice of facilitating learning and improving performance through the development, utilization, and management of appropriate resources and technology (Januszewski & Molenda, 2008, p. 60).

The development of interactive multimedia products for PKWU (Creative Products & Entrepreneurship) learning in vocational schools (SMK) is guided by available resources, needs analysis, and technological advancements. The goal is to create effective learning media that enhance education quality, specifically by increasing student motivation and learning outcomes in achieving classroom learning objectives.

Based on field trials conducted with 101 students in the experimental class, the effectiveness of the interactive multimedia product was evaluated in terms of its impact on learning motivation. The results indicate an average total score of 36.15, equivalent to 90%, placing the multimedia learning product in the 'feasible' category for use in PKWU learning. The media evaluation process involved theoretical assessments by media and subject matter experts, as well as practical evaluations by ICT teachers and students. The findings confirm that the developed interactive multimedia product is suitable for supporting the learning process.

As an interactive multimedia program, this learning tool is fully integrated with information and communication technology (ICT) and is designed for both computer and smartphone use. Given the increasing reliance on digital technology, Generation Z students—who have grown up in a digital environment—demonstrate high competency in using computers and smartphones for learning. This aligns with Ki Hajar Dewantara's educational philosophy, which emphasizes that each generation has distinct characteristics shaped by their era (Wiryopranoto et al., 2017). Thus, utilizing technology-driven learning media aligns with the natural learning tendencies of today's students, making interactive multimedia an essential tool for modern education.

The choice to develop an interactive multimedia program based on Canvasites developed by researchers is based on the results of the needs analysis so that there is a match between the criteria in selecting a learning media and the type of learning media product to be developed, where the type of product is in accordance with the results of the needs analysis (Musfiqon, 2012, p. 86). Before determining the type of learning media, it is necessary to consider several criteria, including 1) the suitability of the media with learning objectives, 2) appropriate, in accordance with the material being studied, 3) the characteristics of students, both in terms of ability, social and psychological, 4) the availability of supporting facilities, 5) the skills of educators in utilizing and 6) if possible the media must have a small production cost. The local potential-based interactive multimedia program developed has the characteristics to display various components of learning material or information, such as text, images, animation, sound, background music, video and practice questions that are integrated into one program connected to the internet so that it can be accessed from anywhere and anytime. So that through this interactive multimedia program based on Canvasites, it is expected to help students in achieving learning objectives.

### 3.2 Product Testing

To address the research question regarding the impact of Canvasites-based interactive learning media on student motivation and learning outcomes, experimental testing was conducted in student classrooms. Data were collected from 101 respondents (100% of the experimental class sample) to measure student learning motivation. The findings indicate that the average motivation score among students in the experimental class was 36.15 out of a maximum score of 40, representing 90% of the highest possible score. This suggests that students exposed to Canvasites-based interactive learning media exhibit very high motivation levels, reinforcing its effectiveness in enhancing engagement.

The data analysis further supports the conclusion that Canvasites-based interactive learning media significantly enhances student motivation. Specifically, student responses indicate that Canvasites learning media is:

- Interesting (87 students, 86%),
- Easy to learn (92 students, 91%),
- Visually engaging (88 students, 87%),
- Easily accessible (90 students, 89%),

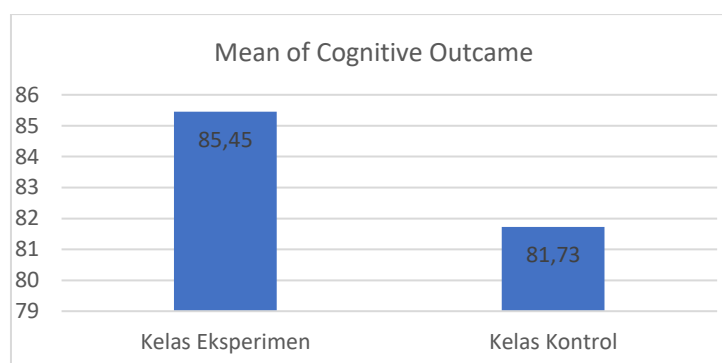
- User-friendly (89 students, 88%),
- Familiar as a digital platform (40 students, 39%),
- Rarely experiences technical issues (66 students, 65%),
- Provides digestible and interactive exercises (85 students, 84%).

Additionally, interviews confirm that students in the experimental class responded positively to the Canvasites-based learning media, expressing enthusiasm and engagement. This aligns with previous studies indicating that interactive learning media enhances student attention and fosters motivation (Nurmiati & Gazali, 2018, p. 105).

The effectiveness of Canvasites-based learning media was further examined using the Independent Samples Test to compare learning outcomes between the experimental and control classes. The results reveal that the Sig. (2-tailed) value  $< 0.05$ , indicating a statistically significant difference in student performance before and after using Canvasites-based interactive media. The average score in the experimental class (85.45) was higher than the control class (81.73), confirming the research hypothesis ( $\mu_1 > \mu_2$ ) that Canvasites-based learning media improves student learning outcomes in product packaging design and labeling.

Moreover, the N-Gain test results further validate the effectiveness of the learning media. The mean N-Gain score for the experimental class (0.1571) was higher than the control class (0.0324), classifying Canvasites-based interactive learning media as Moderately Effective according to the N-Gain category table.

The combined results from statistical tests confirm that Canvasites-based interactive multimedia positively influences student learning outcomes. The experimental class demonstrated higher affective competence, improved motivation, and better knowledge retention in product packaging design and labeling. This research provides strong empirical evidence that Canvasites-based interactive learning media is an effective tool for enhancing vocational education outcomes.



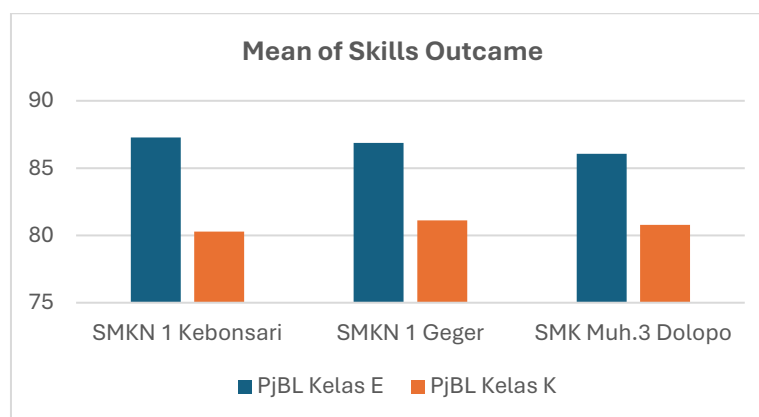
**Figure 1.** Average learning outcomes

Posttest results from the experimental class indicate an average score of 85.45, compared to 81.73 in the control class. This demonstrates a moderate improvement in learning outcomes for students using Canvasites-based interactive learning media in product packaging design and labeling. The reason this increase falls within the moderate category is primarily due to the format of the pretest-posttest questions, which were limited to multiple-choice questions. A more diverse assessment approach, incorporating varied question types and practical application-based tasks, could potentially yield higher learning outcome improvements.

Additionally, learning outcomes in skill-based competencies, particularly those involving student-created projects under the Project-Based Learning (PjBL) approach, significantly influenced student achievement in product packaging design and labeling. Since project performance scores contribute to

overall learning outcomes, the students' ability to apply their knowledge in real-world scenarios plays a crucial role in their success.

The assessment of student projects is based on structured PjBL evaluation criteria, which includes jobsheets used for evaluating practical assignments. The following diagram presents the distribution of project assessment results, providing a visual representation of student performance in practical applications.



**Figure 2.** Average learning skills outcomes

The analysis of skill-based learning outcomes demonstrates a significant difference in class averages between the experimental and control groups across the three research locations. At SMK Negeri 1 Kebonsari, the experimental class achieved an average score of 87.27, while the control class averaged 80.28. At SMK Negeri 1 Geger, the experimental class scored 86.86, compared to 81.11 in the control class. Similarly, at SMK Muhammadiyah 3 Dolopo, the experimental class scored 86.06, while the control class achieved 80.78. These results indicate that Canvasites-based learning media effectively enhances students' skill development in product packaging design and labeling across different vocational school settings.

The success of this media is evident in the students' ability to complete tasks efficiently, plan product designs systematically, and produce high-quality packaging and labeling. The integration of Canvasites fosters an engaging learning environment characterized by collaboration, independence, creativity, and critical thinking—all key components of the Pancasila Student Profile in the Merdeka Curriculum. Moreover, the Project-Based Learning (PjBL) approach aligns with industry standards, ensuring that vocational students develop discipline and adherence to Standard Operating Procedures (SOPs) required in real-world business and industrial environments.

The effectiveness of Canvasites-based interactive multimedia is supported by Edgar Dale's Cone of Experience theory, which emphasizes that learning becomes more effective when students engage in concrete experiences rather than abstract concepts (Lee & Reeves, 2007, p. 56). As students interact with visual, hands-on, and multimedia-based content, they retain knowledge more effectively and develop a deeper understanding of concepts and competencies. This confirms that Canvasites-based learning media is a powerful tool for enhancing vocational education by providing students with meaningful, experience-based learning opportunities.

#### 4. CONCLUSION

This study concludes that the development of Canvasites-based interactive learning media is an effective solution for addressing learning challenges in PKWU (Creative Products & Entrepreneurship) education. The ADDIE model (Analysis, Design, Development, Implementation, and Evaluation)

guided the systematic development of this media, ensuring its feasibility and effectiveness. The effectiveness test demonstrated that Canvasites-based learning media significantly enhances student motivation, as confirmed by questionnaire and interview results, where the majority of students expressed enthusiasm for this interactive approach. Furthermore, statistical analysis, including the Independent Samples Test (Sig. < 0.05), revealed a significant improvement in students' knowledge and skill-based learning outcomes in the experimental group compared to the control group. The N-Gain test further validated the media's impact, with the experimental class achieving a mean score of 0.1571, categorized as Moderately Effective, compared to 0.0324 in the control class.

Despite these positive findings, this study has certain limitations, including a restricted research sample size and content coverage limited to one PKWU learning outcome. Future research should explore a broader sample group and expand the media's application to other subjects for greater effectiveness. Additionally, while Canvasites-based media can be used independently by students, teacher guidance remains essential for optimal learning outcomes. Further refinement of the learning materials is also necessary to cover all PKWU topics comprehensively. Expanding this research into other subject areas and diverse educational settings is recommended to fully realize the potential of Canvasites-based interactive learning media in improving digital learning experiences.

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