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# THE EFFECT OF AI AND CANVA-BASED PBL LEARNING MODELS ON LEARNING MOTIVATION OF GRADE XI TKJ STUDENTS AT SMKN 1 REJOTANGAN

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***ABSTRACT-This research was motivated by problems related to low student learning motivation in TKJ subjects. This is because the learning process still tends to be monotonous and the use of less varied aids, so that it does not attract students' attention optimally. This study aims to determine the effect of using the AI-based Problem Based Learning model and Canva on the learning motivation of class XI TKJ students at SMKN 1 Rejotangan. This type of research is quantitative with an experimental method with a Nonequivalent Control Group research design. The data collection technique used a questionnaire. The sample in this study were students of class XI TKJ 1 and XI TKJ 3, where each class consisted of 37 students. The results of the Independent Sample Test showed that the average posttest score in the control group was 48.95, while in the experimental group the average posttest score was 56.68. The results of this study indicate that there is an influence after the implementation of the AI and Canva-based Problem Based Learning Model on the learning motivation of class XI TKJ students at SMKN 1 Rejotangan. The results are supported by the hypothesis test which shows a significance value (Sig. 2 tailed) of <0.01 which is smaller than the significance level of α = 0.05, so that $H_0$ is rejected and $H_1$ is accepted. This means that there is a positive and significant influence after the implementation of the AI and Canva-based PBL learning model.***

***Keywords: AI, Canva, Learning motivation, Problem-Based Learning, TKJ***

## I. INTRODUCTION

In recent decades, the rapid growth of Information and Communication Technology (ICT) has had a significant impact on various aspects of human life. This technological advancement has brought major changes to the field of education. The utilization of ICT in learning processes has encouraged the emergence of various new teaching methods and models for educators [1]. Technology has evolved from simple teaching aids into highly complex and sophisticated systems, making learning more effective, interactive, and enjoyable. Technology in education has become an inseparable necessity—not only in accessing learning materials, but also in how students and teachers interact and how instruction is delivered.

SMKN 1 Rejotangan, as a formal educational institution in the region, is committed to continually improving the quality of its learning process. As part of the independent curriculum (kurikulum merdeka), the school has implemented various innovations in teaching. Teachers have applied several effective learning models in TKJ (Computer and Network Engineering) subjects, such as Problem-Based Learning (PBL), Project-Based Learning (PJBL), and Discovery Learning. PBL helps students develop critical thinking and problem-solving skills through real-world scenarios; PJBL combines PBL with practical projects in which students work collaboratively to design and create outcomes; while Discovery Learning encourages students to discover concepts and solutions independently through exploration, experimentation, and analysis, fostering active engagement with the learning material. The policy on gadget usage at SMKN 1 Rejotangan plays an important role in ensuring that technology is effectively used to support the learning process. The school provides Wi-Fi access and technology-friendly learning environments; however, it ultimately depends on each teacher's discretion, as there are times when gadget use is restricted in class.

Education has been heavily influenced by the emergence of AI tools such as ChatGPT and graphic design applications like Canva. According [2], integrating AI into education can create a more inclusive and accessible learning environment for all students, empowering them to thrive in the digital era. Artificial Intelligence has the potential to transform education by personalizing learning experiences, providing intelligent tutoring, integrating immersive technologies, and automating content creation [3]. Stated that Canva simplifies the teaching and learning process for both teachers and students by integrating technology, skills, and creativity [4]. Canva's visual design capabilities can increase student interest in learning activi-

ties and boost motivation through engaging instructional materials. It enables users without design expertise to create attractive learning content, while AI can rapidly analyze data and provide relevant recommendations. Both tools can enhance students' motivation and comprehension, especially in vocational schools.

Learning motivation is one of the key factors in the success of education. Motivation determines the extent to which a student strives to understand, retain, and apply learning materials. It is a fundamental prerequisite for learning; a student who learns without motivation (or with low motivation) will not achieve optimal results [5]. Learning motivation not only affects academic achievement but also influences students' engagement in the learning process. It can be defined as an internal or external drive that compels a person to learn and achieve their academic goals. John M. Keller, as cited in [6], developed the ARCS Model as a framework to enhance and maintain students' learning motivation. This model consists of four main elements: Attention, Relevance, Confidence, and Satisfaction ;

1. Attention
   This component relates to how educators can attract and maintain students' interest in learning. Woodruff, as quoted by Callahan (1966: 23), stated that learning will not occur without the student's interest or attention. Keller, as cited by Reigeluth (1987: 383–430), emphasized that students' attention must not only be triggered at the beginning of a lesson but also sustained throughout the learning process. Therefore, educators need to consider various strategies to focus and retain students' attention.
2. Relevance
   This element concerns the connection between the learning material and students' personal experiences—both current and past—as well as how the material relates to their needs or career goals, whether short-term or long-term.
3. Confidence
   Gagné and Driscoll (1988: 70) noted that individuals with higher levels of confidence are more likely to succeed, regardless of their actual ability. A person's belief in their ability to succeed encourages behavior that leads to goal achievement.
4. Satisfaction
   This component involves the feeling of satisfaction or pride in one's accomplishments. Students who successfully complete tasks or achieve specific learning objectives experience a sense of fulfillment, which in turn becomes motivation for future success. Hilgard and Bower (1975: 561) stated that reinforcement that brings about satisfaction and pride is essential in the learning process.

Motivation in learning can manifest in various forms, depending on the influence of both internal and external factors experienced by students. According to Prayitno (1989:10), as cited in [7], motivation can be classified into two types: intrinsic motivation and extrinsic motivation.

1. Intrinsic Motivation
   Thornburgh, as cited by Prayitno (1989:10), explains that intrinsic motivation originates from within the individual, driven by the desire to act of one's own free will. A person with this type of motivation experiences satisfaction when the activity undertaken yields results and involves personal engagement. Gunarsa (2008:50) also states that intrinsic motivation is a strong internal drive within an individual. The greater this drive, the more likely the individual is to display persistent behavior in striving toward their goals.
2. Extrinsic Motivation
   This type of motivation arises when a person engages in an activity not for the sake of the activity itself, but to achieve something external to it. Gunarsa (2008:51) describes extrinsic motivation as a drive that originates from outside the individual, whether through direct observation or from suggestions, advice, or the influence of others.

However, few studies on educational technology have specifically investigated the direct impact of AI and Canva on student motivation at vocational schools (SMK). PBL is a model in which students are confronted with real-world problems that they may have encountered in their own lives [8]. PBL allows students to see a direct connection between what they are learning and real-life situations, making learning more meaningful and engaging. Active involvement in learning makes students more curious, interested, and motivated. The collaborative nature of PBL, where students work in groups, fosters a supportive and positive learning environment. It also provides learners with more autonomy and responsibility, giving them a sense of ownership and motivation.

Nonetheless, implementing PBL faces challenges, especially in attracting students' interest and increasing their engagement. The lack of variety in material delivery and the limited use of innovative tools may cause students to feel demotivated. Therefore, new and engaging approaches aligned with technological advancements are needed. One potential solution is to integrate Artificial Intelligence (AI) and the Canva graphic design application into the PBL model. The combination of PBL with technology is expected to enhance students' motivation, engagement, and learning outcomes.

Previous research by [9] analyzed the impact of AI in learning at Cyber University, focusing on higher education and digital environments. The key difference lies in the education level, learning approach, and research context. While their study examined AI in general, this research specifically explores the integration of AI and Canva within PBL. The research gap lies in the absence of similar studies at the vocational level, which positions this study to offer a new contribution in enhancing the effectiveness of technology-based vocational education.

A study by [10] showed that Canva effectively increased student motivation in science subjects at MTs Syekh Yusuf Gowa. However, that research only focused

on Canva as a stand-alone learning medium, without integration with other technologies such as AI, and was not applied in vocational education like TKJ. Moreover, the study used a one-shot case study design without incorporating a more interactive project-based approach.

Another study by [11] examined the effect of AI-based PBL on student learning outcomes. In contrast, this study focuses on student motivation and integrates AI with Canva, adding a visual and creative dimension to learning. Their study was conducted at the senior high school level in the subject of Civics (PPKn), whereas this research is conducted at the vocational school level (SMK), specifically in TKJ, which is more skill-oriented. This study offers a new perspective on how combining AI and Canva in PBL can enhance motivation among vocational students who face different needs and challenges than general high school students.

Based on observations conducted by the researcher on November 25, 2024, it was found that low student motivation in class XI TKJ at SMKN 1 Rejotangan was primarily caused by the use of monotonous teaching tools such as PowerPoint and conventional videos that failed to capture students' interest. These issues were evident through students' frequent boredom, decreased concentration, and lack of response to the delivered material. One way to improve student motivation is to use interactive learning tools based on AI, such as ChatGPT, which serves as a platform for students to search for information, and Canva as a medium for presenting creative and engaging visual results. The integration of these tools is expected to help students better understand the learning material and achieve satisfactory outcomes. Based on the background described above, this study is entitled: "The Effect of AI- and Canva-Based Problem-Based Learning Model on the Learning Motivation of 11th Grade TKJ Students at SMKN 1 Rejotangan."

**Table 1.** Syntax of the PBL Learning Model

| Fase | Perilaku Guru |
|---|---|
| • Phase 1: Providing students with an orientation to the problem | • The teacher discusses learning objectives, describes essential logistical needs, and motivates students to engage in problem-solving activities. |
| • Phase 2: Organizing students for research | • The teacher helps students define and organize learning tasks related to the problem. |
| • Phase 3: Supporting independent and group investigations | • The teacher encourages students to obtain appropriate information, conduct experiments, and seek explanations and solutions. |
| • Phase 4: Developing and presenting work results | • The teacher assists students in planning and preparing appropriate work, such as reports, and helps them share their work with their peers. |
| • Phase 5: Analyze and evaluate the problem-solving process. | • The teacher helps students reflect on their investigations and the processes they used. |

## II. RESEARCH METHOD

This research employed a quantitative approach with a quasi-experimental design to determine the effect of the Problem-Based Learning (PBL) model based on Artificial Intelligence (AI) and Canva on students' learning motivation. A quasi-experimental method was chosen because it does not allow full randomization of research subjects, yet it still allows the researcher to compare the treatment effect on two relatively equivalent groups [12]. The design used was the Nonequivalent Control Group Design, involving two groups: an experimental group and a control group. Both groups were not selected randomly but were considered to have comparable initial characteristics. The experimental group received treatment through the implementation of the AI- and Canva-based PBL model, while the control group followed conventional instruction as usual. Both groups were given pretests and posttests to measure learning motivation and to evaluate the effectiveness of the given treatment.

The research subjects were 11th-grade students of the Computer and Network Engineering (TKJ) program at SMKN 1 Rejotangan in the 2024/2025 academic year. The sampling technique used was purposive sampling, which selects samples based on specific criteria aligned with the research objectives. In this study, class XI TKJ 1 was designated as the experimental group and XI TKJ 3 as the control group, each consisting of 37 students. The selection was based on similarities in the number of students, relatively balanced academic abilities, and equal access to learning facilities.

According to [13], a variable is a measurable and modifiable concept used to represent phenomena in research. A similar understanding is conveyed by [14], who defines a variable as an attribute of a person or object that varies from one another. The independent variable in this study is the AI- and Canva-based PBL model, while the

dependent variable is students' learning motivation. To measure learning motivation, a questionnaire was used, developed based on the indicators of learning motivation proposed by [15], which include five aspects: (1) the desire and ambition to succeed, (2) the drive and need to learn, (3) expectations and future aspirations, (4) engaging learning activities, and (5) a conducive learning environment. The questionnaire used a Likert scale with five answer choices: Strongly Disagree (1), Disagree (2), Somewhat Agree (3), Agree (4), and Strongly Agree (5).

Before being used, the questionnaire was tested for validity and reliability to ensure that the instrument accurately measured what it intended to measure. Validity was tested using the Pearson Product-Moment correlation technique. The results showed that out of 20 items, 14 items were valid ($r > 0.3610$, $N = 30$, $\alpha = 0.05$), and 6 items were invalid and excluded. The reliability test using Cronbach's Alpha on the 14 valid items yielded a score of 0.964, indicating that the instrument had a very high level of reliability and was appropriate for data collection. Data collection techniques included three methods: (1) Questionnaire as the primary instrument to measure students' motivation before and after the treatment, (2) Observation to record student involvement and activity during the learning process, and (3) Documentation in the form of activity photos, student work results, and notes during learning activities as supporting data.

Before conducting inferential statistical tests, the collected data were first analyzed for normality and homogeneity. The normality test was conducted using the Shapiro-Wilk test, which showed that all data, both pretest and posttest from both groups, had significance values above 0.05. This indicates that the data were normally distributed and met the assumptions for parametric analysis. Then, Levene's Test was used to assess homogeneity of variances, which showed a significance value of 0.177 (> 0.05), indicating that the variances between the groups were homogeneous. With both assumptions fulfilled, data analysis continued with the independent sample t-test to determine whether there was a significant difference in learning motivation between the experimental and control groups. The results showed that the average posttest score for the experimental group was 56.68, while the control group scored 48.95. The t-test yielded a significance value (Sig. 2-tailed) of < 0.001, which is less than the significance level of 0.05. Thus, it can be concluded that there is a statistically significant difference between the two groups, indicating that the AI- and Canva-based PBL model has a positive effect on increasing students' learning motivation. Overall, this method enables researchers to examine the cause-and-effect relationship between the implementation of the learning model and the improvement in student motivation, while providing an objective and measurable evaluation of the effectiveness of integrating AI and Canva technologies in problem-based learning (PBL).

**Table 2.** Nonequivalent control group design

| Group | Pre-test | Treatment | Post-test |
|---|---|---|---|
| experiment | $O_1$ | X | $O_2$ |
| Control | $O_3$ | - | $O_4$ |

*Source: Sugiyono 2023*

Description:
O1: Pre-test given to the experimental group before treatment.
O2: Post-test given to the experimental group after treatment.
O3: Pre-test given to the control group before treatment.
O4: Post-test given to the control group after treatment.
X: Treatment for the experimental class using the Problem-Based Learning model.

**Table 3.** Number of Class XI TKJ Students at SMK Negeri 1 Rejotangan

| No | Class | Amount |
|---|---|---|
| 1 | XI TKJ 1 | 42 |
| 2 | XI TKJ 2 | 42 |
| 3 | XI TKJ 3 | 42 |
| | Total Population | 126 |

*Source: State Vocational School 1 Rejotangan, 2024/2025 academic year*

**Table 4.** Likert Scale

| No | Information | Score | |
|---|---|---|---|
| | | Positive | Positive |
| 1 | Strongly Disagree | 1 | 5 |
| 2 | Disagree | 2 | 4 |
| 3 | Somewhat Disagree | 3 | 3 |
| 4 | Agree | 4 | 2 |
| 5 | Strongly Agree | 5 | 1 |

*Source: Sugiyono 2023*

## III. RESULTS AND DISCUSSION

This study aimed to determine the effect of the Problem-Based Learning (PBL) model based on Artificial Intelligence (AI) and Canva on the learning motivation of 11th-grade TKJ students at SMKN 1 Rejotangan. Data were collected through the distribution of learning motivation questionnaires before and after the implementation of the learning model. The questionnaire had undergone validity and reliability testing, making it appropriate for use as a measurement instrument in this study. After the learning process was completed, pretest and posttest data were collected from both groups. Data analysis was conducted in stages, beginning with descriptive statistical analysis and continuing with inferential statistics. Based on the descriptive analysis results, the average posttest motivation score for the experimental group was 56.68, while the control group scored 48.95. This indicates a notable difference, where the experimental group experienced a greater increase in learning motivation after the implementation of the AI- and Canva-based PBL model.

To ensure that the difference was not due to chance, assumption tests for parametric statistics were conducted, namely the normality and homogeneity tests. The Shapiro-Wilk normality test indicated that all data (both pretest and posttest from both groups) had significance values above 0.05, meaning the data were normally distributed and met the requirements for parametric testing. Furthermore, the Levene's Test for homogeneity showed a significance value of 0.177 (> 0.05), indicating that the variances between the groups were homogeneous. With these assumptions fulfilled, the data were further analyzed using an independent sample t-test. The t-test result showed that the significance value (Sig. 2-tailed) for the posttest comparison between the experimental and control groups was < 0.001. This value is far below the 0.05 threshold, indicating a statistically significant difference between the two groups. Thus, it can be concluded that the implementation of the AI- and Canva-based PBL model significantly improves students' learning motivation.

The increased learning motivation in the experimental group can be examined through the five indicators used in this study. First, in the indicator of desire and ambition to succeed, students in the experimental group demonstrated greater enthusiasm and clearer learning goals. Second, the drive and need to learn were evident through students' increased initiative to seek additional information via AI tools such as ChatGPT. Third, regarding hope and future aspirations, students became more focused in planning their learning steps because the process felt more relevant to real-world applications. Fourth, learning activities became more engaging as students created presentations and task visualizations using Canva, enhancing their involvement in the learning process. Finally, a more conducive learning environment was established as students felt more comfortable, challenged, and less likely to feel bored during the sessions.

These findings align with the ARCS theory developed by [5], which states that learning motivation can be increased when instruction captures attention, is relevant to student needs, builds confidence, and provides satisfaction. The AI- and Canva-based PBL model fulfills all four of these aspects. AI tools like ChatGPT help students understand material in a more personalized manner, while Canva supports visual creativity in presenting problem-solving outcomes. In addition, these results reinforce previous research by [3], which stated that using Canva in learning can increase student interest, and a study by [8], which found that visual-based media positively affect motivation. While earlier studies typically focused on AI and Canva separately, this research offers a synthesis of both within a PBL context, which proves to be significantly effective.

Furthermore, the observed increase in motivation also highlights that technological integration is not merely a support tool, but serves as a stimulus for enhancing the holistic learning experience. Technology enables personalization, visualization, and interactivity in learning, all of which are essential to creating meaningful and enjoyable educational experiences for vocational students. Hence, the results and discussion of this study demonstrate that implementing the AI- and Canva-based PBL model is not only effective in improving students' overall motivation but also positively impacts specific motivational aspects. This model offers an innovative alternative for teachers in designing meaningful, contextual, and relevant learning experiences that meet 21st-century learning demands. The study also opens opportunities for further research to explore deeper integrations of technology within innovative instructional models in vocational education settings.

**Table 5.** Results of Descriptive Statistical Tests

| | N | Minimum | Maximum | Mean |
|---|---|---|---|---|
| Pretest Control | 37 | 43 | 60 | 51,35 |
| PostTest Control | 37 | 42 | 58 | 48,95 |
| Pretest Experiment | 37 | 46 | 67 | 55,59 |
| PostTest Experiment | 37 | 45 | 67 | 56,68 |
| Valid N (listwise) | 37 | | | |

*Source* : Output SPSS 29

**Table 6.** Validity Test Results

$R_{table}$=0,3610

| Item-Total Statistic | | |
|---|---|---|
| No | Corrected Item - Total Correlation | Information |
| 1 | 0,083 | Invalid |
| 2 | 0,831 | Valid |
| 3 | 0,874 | Valid |
| 4 | 0,845 | Valid |
| 5 | 0,777 | Valid |
| 6 | 0,083 | Invalid |
| 7 | 0,737 | Valid |
| 8 | 0,891 | Valid |
| 9 | 0,057 | Invalid |
| 10 | 0,864 | Valid |
| 11 | 0,057 | Invalid |
| 12 | 0,783 | Valid |
| 13 | 0,773 | Valid |
| 14 | 0,664 | Valid |
| 15 | 0,791 | Valid |
| 16 | 0,069 | Invalid |
| 17 | 0,793 | Valid |
| 18 | 0,738 | Valid |
| 19 | 0,821 | Valid |
| 20 | 0,066 | Invalid |

**Table 7.** Reliability Test Results

| Cronbach's Alpha | N of Items |
|---|---|
| 0,964 | 14 |

**Table 8.** Normality Test Results

| | Shapiro-Wilk |
|---|---|

| | Df | Sig. |
|---|---|---|
| Pretest_Control | 37 | 0,775 |
| Posttest_Control | 37 | 0,181 |
| Posttest_Eksperiment | 37 | 0,079 |
| Pretest_Eksperimen | 37 | 0,189 |

*Source* : Output SPSS 29

**Table 8.** Homogeneity Test Results

| | Levene Statistic | Sig. |
|---|---|---|
| Based on Mean | 1.857 | 0,177 |

*Source* : Output SPSS 29

**Table 9.** Independent Samples Test

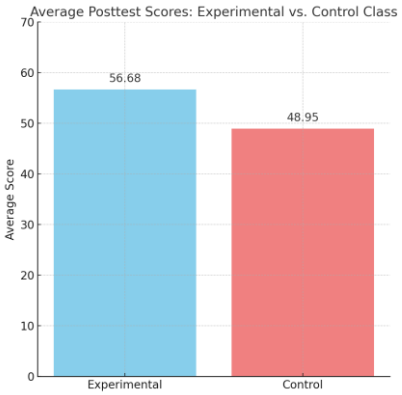
| | Two-Sided p |
|---|---|
| Result Value | <0,001 |
| | <0,001 |

*Source* : Output SPSS 29

## IV. CONCLUSION

Based on the results of data analysis and the discussions carried out, it can be concluded that the implementation of the Problem-Based Learning (PBL) model based on Artificial Intelligence (AI) and Canva has a positive and significant effect on the learning motivation of 11th-grade students in the Computer and Network Engineering (TKJ) program at SMKN 1 Rejotangan. This is indicated by the difference in the average posttest scores between the experimental and control groups, where the experimental group achieved an average score of 56.68, while the control group only reached an average of 48.95 after the learning was completed. This difference shows that the experimental group experienced a greater increase in learning motivation compared to the control group. The result of the independent sample t-test showed a significance value (Sig. 2-tailed) of < 0.001, which is smaller than the significance level of 0.05, indicating a statistically significant difference between the two groups.

The increase in students' learning motivation is reflected in the five measured indicators, namely: the desire and ambition to succeed, the drive and need to learn, expectations and future aspirations, engaging learning activities, and a conducive learning environment. The PBL model integrated with AI and Canva has proven capable of creating a more active, contextual, and engaging learning process. AI technology such as ChatGPT helps students explore information independently and personally, while Canva provides a creative and communicative visual medium for presenting learning outcomes. Therefore, the AI- and Canva-based PBL model can serve as an effective alternative learning strategy to enhance students' learning motivation, especially in vocational education settings. This study also opens up opportunities for educators to continue innovating in utilizing digital technology to create interactive, relevant, and future-oriented learning environments that support the development of 21st-century skills. However, this study has limitations, one of which is the limited time of implementation, which was conducted in a single learning session. Therefore, future research is recommended to examine the use of this model over a longer period and to involve learning outcomes or other skill aspects as research variables.

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