

Developing a Humanistic Vocational Learning Model Based on Self-Determination Theory to Enhance Student Motivation

Farah Maulida Amalia, Beti Istanti Suwandayani*, Agus Tinus

Universitas Muhammadiyah Malang, Malang, Indonesia

*Corresponding Email: beti@umm.ac.id

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ABSTRACT

Vocational education is expected to produce graduates who are technically competent, motivated, adaptive, and prepared for lifelong learning. However, vocational learning often overlooks students' psychological needs, reducing learning motivation. This study developed a humanistic vocational learning model based on Self-Determination Theory (SDT), emphasizing autonomy, competence, and relatedness. Using a Research and Development approach with the ADDIE model, the study involved 13 students from SMK Muhammadiyah 02 South Tangerang. Data were collected through observations, interviews, expert validation, and learning motivation questionnaires. Expert validation indicated that the model was highly feasible (94.8%). Students' average motivation scores increased from 60.00 in the pre-test to 62.62 in the post-test. Normality testing confirmed normal data distribution, while the Wilcoxon Signed Rank Test showed no statistically significant difference ($p = .620$). Nevertheless, the findings suggest that SDT-based vocational learning has strong potential to enhance students' motivation, engagement, and contextual learning experiences.

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Introduction

Vocational education plays a central role in preparing students not only with technical skills but also with the ability to learn independently, adapt to change, and remain productive throughout their careers. In Indonesia, Vocational High Schools hold a crucial mandate within the national education system to produce competent and work-ready graduates (Asfiyanur et al., 2018; Yoto et

al., 2022). This mandate is reflected in the government's increasing efforts to strengthen the relevance of vocational education to industry needs, as evidenced by the significant increase in the participation of SMK graduates in tracer studies from 66.88% in 2022 to 95.88% in 2024 Kementerian Pendidikan Dasar dan Menengah (2024). However, increased participation in tracer studies does not necessarily indicate that the learning process has been effective in equipping students with sustainable competencies and independent learning skills needed in the modern workforce.

Despite these efforts, data from the Central Statistics Agency (BPS) in 2024 showed that the open unemployment rate for vocational school graduates reached 8.63%, the highest compared to graduates of other educational levels BPS (2024). This condition indicates not only a mismatch between graduate competencies and labor market needs, but also more fundamental pedagogical problems in the implementation of vocational education (Ibadov et al., 2020; Li and Rohayati, 2024). Among the most dominant problems is the dominance of teacher-centered and procedure driven learning practices that leave little room for students to develop intrinsic motivation, self-regulation, and ownership of their learning. Vocational education also has a broader social function in supporting national economic development by reducing unemployment and enhancing the global competitiveness of the workforce (Lee et al., 2020; Storonyanska et al., 2025). These economic expectations place considerable pressure on vocational schools to go beyond simply transmitting technical skills. Students must be equipped with the dispositions and motivational capacities that enable them to continue learning and adapt well into professional careers. However, current pedagogical practices in some vocational high schools (SMK) do not fully consider the psychological dimensions of learning, which are crucial to achieving this goal.

Empirical evidence from initial observations and interviews conducted at SMK Muhammadiyah 02 in South Tangerang confirms these concerns. The learning process at this school was found to be largely dominated by a procedural approach, oriented toward completing tasks in which students occupy a passive role. Students exhibited relatively low levels of learning motivation and limited engagement in reflective or independent learning activities Sicard et al (2024). Learning patterns that emphasize short-term technical outcomes tend to neglect students' deeper psychological needs, including the need to feel autonomous in decision-making, competent in addressing meaningful challenges, and connected to their peers and teachers (Cheon et al., 2020; Indriayu, 2025). When these needs are not met, students are less likely to develop the intrinsic motivation necessary for sustained learning engagement.

The low level of learning motivation observed in vocational school settings reflects a broader pattern recognized in educational research: learning practices that primarily focus on procedural competence and external accountability can inadvertently undermine students' psychological well-being and motivation (Bureau et al., 2022; Wilding, 2015; Zheng, 2025). Specifically, students who do not feel autonomous in their learning, do not perceive themselves as competent, and do not feel a sense of belonging in the learning environment are less likely to engage deeply with learning tasks (Agustina et al., 2025; Ruzek et al., 2016). The fulfillment of these psychological needs plays a crucial role in fostering intrinsic motivation, sustained engagement, and readiness for lifelong learning (Guay, 2022; Masran et al., 2025; Shevchenko et al., 2025).

Self-Determination Theory (SDT) offers a robust and empirically supported framework for addressing challenges in the development of intrinsic motivation. SDT posits that three basic psychological needs: autonomy, competence, and relatedness, are universal and essential for intrinsic motivation, psychological well-being, and sustained engagement across a variety of learning contexts (Ryan and Deci, 2017, 2020). Learning environments that support these three needs are theoretically and empirically linked to higher levels of intrinsic motivation, deeper learning engagement, and greater persistence in the face of adversity. Conversely, environments that control or inhibit these needs result in inactivity, anxiety, and diminished extrinsic motivation over time (Cheon et al., 2020; Slemp et al., 2024).

Although SDT-based learning approaches have been widely studied in general education contexts, their systematic integration into vocational learning remains limited. Most existing studies focus on measuring motivation levels or implementing isolated strategies rather than developing comprehensive, structured, and context-based learning models specifically designed for vocational education settings (Pramono and Surjaningrum, 2023; Purwanti and Octavia, 2023; Wang et al., 2024; Yan et al., 2025). This represents a significant gap in the literature that this study aims to address.

The novelty of this research lies in the development of a humanistic vocational learning model that systematically integrates the three core dimensions of Self-Determination Theory (SDT), namely autonomy, competence, and relatedness. The study emphasizes the structured design of an SDT-based humanistic learning model through the ADDIE framework.

This model is contextually developed to align with the characteristics and learning needs of vocational students in Indonesian vocational high schools, with the aim of supporting the fulfillment of students' basic psychological needs and enhancing both learning processes and outcomes.

Accordingly, this study is guided by the following research question: To what extent does an SDT-based humanistic vocational learning model improve students' learning motivation in vocational education?

Method

This research uses a Research and Development (R&D) approach with the ADDIE model, consisting of five sequential phases: Analysis, Design, Development, Implementation, and Evaluation (Branch and Varank, 2009; Waruwu, 2024). This approach was chosen because the main objective of this study is to develop and empirically evaluate a humanistic vocational learning model based on Self-Determination Theory (SDT). The ADDIE framework is well-suited for this purpose because it provides a systematic structure for designing, developing, and evaluating educational interventions in authentic classroom contexts.

This research was conducted at SMK Muhammadiyah 02 in South Tangerang City. The participants consisted of 13 students from the Computer and Network Engineering Study Program. Purposive sampling was applied to select participants, as this class was considered representative of the characteristics and challenges of vocational school students in an urban environment, and because preliminary observations had confirmed low motivation and teacher-centered learning practices in this class. The limited number of participants reflects the nature of this study as an early development pilot within a Research and Development (R&D) framework. The primary objective at this stage was to evaluate the feasibility and initial implementation of the developed learning model before broader implementation in a larger vocational classroom setting. Nonetheless, the authors acknowledge that a sample of 13 participants constitutes a significant limitation of this study, and all quantitative findings should be interpreted with appropriate caution as preliminary evidence rather than broad conclusions. The research procedure followed three integrated stages derived from the ADDIE framework. The first stage encompassed Analysis and Design. In the analysis phase, the research identified existing learning problems, assessed students' motivational profiles, and mapped their psychological needs related to autonomy, competence, and relatedness. This involved preliminary observations, semi-structured interviews with students and teachers, and a documentation review. Based on the findings of this analysis, a humanistic vocational learning model based on SDT was designed. The design phase resulted in a complete model specification, including learning objectives aligned with SDT dimensions, a detailed learning syntax, a structure of learning activities, and assessment techniques that emphasize students' reflective practice.

The second stage covered Development and Implementation. During development, the learning model and its teaching aids, including lesson plans, student worksheets, and facilitation guides, were assembled into a prototype. The prototype was then submitted for expert validation to assess its feasibility across four dimensions: content relevance, clarity of learning syntax, integration of SDT model components, and practicality of implementation in vocational classrooms. Expert validators included subject matter specialists and learning practitioners. After revisions based on expert feedback, the model was implemented through a limited classroom trial. The implementation followed the designed learning syntax and aimed to create conditions that would support the fulfillment of students' three basic psychological needs throughout the learning process (Hoidn and Klemenčič, 2020; Tang, 2023).

The third stage is Evaluation, which is conducted formatively throughout the implementation process and summatively by comparing students' learning motivation scores before and after the intervention. Observation notes and reflective documentation during implementation are used to contextualize and triangulate the quantitative findings.

The main research instrument was a learning motivation questionnaire based on SDT covering three dimensions: autonomy, competence, and relatedness. Supporting instruments included a structured observation guide, an interview guide, and an expert validation sheet. The motivation questionnaire underwent a content validity review by experts before use. Quantitative data analysis was conducted in several stages.

First, percentage analysis was applied to evaluate the feasibility of the product based on expert validation scores using the formula $P = (\sum x / \sum xi) \times 100\%$. Second, the Content Validity Index (CVI) and Content Validity Ratio (CVR) were used to verify the quality of the instrument. Third, descriptive statistical analysis compared pre-test and post-test motivation scores across the three SDT dimensions. Fourth, the Shapiro-Wilk normality test was applied at $\alpha = 0.05$ to determine the distribution of the data. Finally, the non-parametric Wilcoxon Signed-Rank test was used for hypothesis testing, with H_0 rejected if Asymp. Sig. (2-tailed) < 0.05 . This statistical method was selected because the study involved paired data with a relatively small sample size and non-parametric distribution assumptions. The Wilcoxon test is considered appropriate for identifying differences between two related measurements under such conditions. Qualitative data were analyzed using Miles and Huberman's interactive model, which includes data condensation, data display, and conclusion drawing Pane et al (2021).

Result and Discussion

Model Feasibility and Validation

The feasibility of the humanistic vocational learning model based on Self-Determination Theory (SDT) was assessed through an expert validation process involving subject matter experts and learning practitioners. This validation aimed to assess the model's suitability in terms of content relevance, clarity of learning syntax, integration of model components, and practicality of implementation in vocational classrooms. Each aspect was assessed using a structured instrument, and the scores obtained were converted into percentages to determine the model's feasibility level. The results of the expert validation are shown in Table 1.

Table 1. Expert Validation Results of the Learning Model

<i>Aspects Assessed</i>	<i>Percentage (%)</i>	<i>Category</i>
Model Validation	95,8	highly feasible
Learning Validation	93,8	highly feasible
Overall Average	94,8	highly feasible

Based on Table 1, all assessed aspects scored above 90%, with an overall average of 94.8%, which can be categorized as highly feasible. The validation aspect of the developed model achieved the highest score of 95.8%, while the learning validation aspect scored 93.8%. These results indicate that the learning model meets the feasibility criteria both conceptually and practically for use in vocational learning. These findings also indicate that the developed model successfully integrates the three fundamental psychological needs in SDT: autonomy, competence, and relatedness into its structure. Learning models that accommodate these dimensions are crucial for fostering meaningful and motivating learning experiences Ryan and Deci (2020).

The developed learning model integrates humanistic educational principles within each phase of the ADDIE instructional design framework. The humanistic approach emphasizes student-centered learning, psychological well-being, intrinsic motivation, and meaningful learning experiences. The developed learning model integrates humanistic educational principles within each phase of the ADDIE instructional design framework. Unlike conventional vocational learning that primarily centers on procedural content delivery and externally imposed competency targets, the humanistic approach in this model places students' basic psychological needs as the foundational point of instructional design. Specifically, it emphasizes student-centered learning, psychological well-being, intrinsic motivation, and meaningful learning experiences rooted in Self-Determination Theory (SDT).

During the analysis phase, students' motivational challenges and psychological learning needs were identified, particularly related to autonomy, competence, and relatedness as proposed in Self-Determination Theory (SDT). In the design phase, learning activities were structured to provide students with opportunities for self-expression, reflective thinking, collaborative interaction, and learning autonomy. Students were encouraged to actively participate in the learning process rather than merely receiving information passively. During the development phase, contextual learning materials and reflective activities were created to support meaningful engagement and competence development. The instructional materials were designed to connect with students' vocational experiences and personal learning goals. In the implementation phase, teachers acted primarily as facilitators who supported students through constructive feedback, collaborative discussion, and emotionally supportive classroom interactions. Finally, the evaluation phase emphasized not only academic achievement but also student engagement, reflective responses, and motivational development throughout the learning process. The results of integration of humanistic elements presented in Table 2.

Table 2. Integration of Humanistic Elements in the SDT-Based ADDIE Model

ADDIE Development Phase	Humanistic Consideration in Model	SDT Aspect Integrated
Analysis	Identifying students' psychological learning needs	Relatedness
Design	Student choice and reflective learning activities	Autonomy
Development	Contextual and meaningful learning materials	Competence
Implementation	Supportive teacher facilitation and collaboration	Relatedness
Evaluation	Reflective feedback and self-assessment	Autonomy

Instrument Content Validity

In addition to validating the learning model, the learning motivation questionnaire instrument also underwent content validation involving experts. Validity testing was conducted using the Content Validity Index (CVI) and Content Validity Ratio (CVR) approaches to assess the clarity, relevance, and suitability of the items to the constructs of Self-Determination Theory (SDT). The results of the validity testing are presented in Table 3.

Table 3. Clarity, relevance, and Suitability

Aspects Assessed	CVI	CVR	CVR Standard	Category
Clarity	0.80 - 0.90	0.85	1.00	0.016
Relevance	0.70 - 0.90	0.85	1.00	0.016
Suitability	0.70 - 0.90	0.84	1.00	0.016

Based on Table 3, the CVI values ranged from 0.70 to 0.90, while the CVR values ranged from 0.84 to 0.85 with a significance level of 0.016 (<0.05). These results indicate that most of the instrument items were considered clear, relevant, and consistent with the theoretical constructs of SDT. Thus, the learning motivation instrument was declared to have good content validity and is suitable for use in the implementation phase of the research with some minor editorial improvements. This alignment confirms that the instrument is able to measure students' psychological needs accurately, particularly the needs for autonomy, competence, and relatedness, which are central constructs in SDT and are very important in understanding student motivation Deci and Ryan (2000).

Improvement of Student Learning Motivation

A learning motivation questionnaire based on SDT dimensions was used to measure student motivation before and after implementing the learning model. The results of the descriptive statistical analysis showed an increase in learning motivation scores. Table 4 presents descriptive statistics for student learning motivation.

Table 4. Descriptive statistics of Student Learning Motivation

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Std. Deviation</i>
Pretest	13	45.00	79.00	62.00	8.97
Posttest	13	58.00	71.00	62.62	3.99
Valid N (listwise)	13				

Based on Table 4, the results of the descriptive statistical analysis show that at the pretest stage, the students' learning motivation scores had a minimum value of 45.00 and a maximum of 79.00, with an average value (mean) of 62.00 and a standard deviation of 8.97. The relatively large standard deviation value indicates that the level of students' learning motivation before the implementation of the learning model still varied. After the implementation of the SDT-based humanistic vocational learning model, the posttest results showed a minimum value of 58.00 and a maximum of 71.00, with the average value increasing to 62.62 and the standard deviation decreasing to 3.99. This decrease in the standard deviation indicates that the variation in participants' scores tends to be more homogeneous after the implementation of the learning model.

Descriptively, although the average increase in learning motivation scores was relatively small, the change was accompanied by an even distribution of students' learning motivation levels. This indicates that the developed learning model has the potential to create more consistent and equitable learning conditions in supporting students' learning motivation during the limited trial phase. From a Self-Determination Theory (SDT) perspective, these findings suggest that meeting basic psychological needs plays a role in the even distribution of learning motivation. At both stages,

students demonstrated that collaborative learning activities, peer interactions, and social support contributed significantly to student engagement, which is in line with the finding that engagement strengthens emotional engagement and participation (Ruzek et al., 2016; Ryan and Deci, 2000).

In addition, it reflects students' active involvement in decision-making and problem-solving processes, which supports the idea that autonomy enhances intrinsic motivation and self-regulated learning. (Guay, 2022; Ryan and Deci, 2020). Furthermore, improvements suggest that structured and contextualized learning experiences help build students' confidence and mastery, which are key factors in maintaining long-term motivation Masran et al (2025).

Statistical Analysis and Model Effectiveness

The Shapiro-Wilk Test was used to determine whether the pretest and posttest data were normally distributed. Due to the relatively small sample size, this test was deemed appropriate. The results of the normality test are shown in Table 5.

Table 5. Pretest and Posttest learning motivation

<i>Variable</i>	<i>Statistics</i>	<i>Sig. (p)</i>	<i>Description</i>
Pretest learning motivation	0.952	0.154	Normal
Posttest learning motivation	0.905	0.628	Normal

Table 5 shows that the sig. values for the pretest (0.154) and posttest (0.628) are greater than 0.05 ($p > 0.05$), indicating that the pretest and posttest data are normally distributed. Although the results of the normality test indicate that the data are normally distributed, the analysis of differences in pretest and posttest scores was still carried out using the Wilcoxon Signed Rank Test. The selection of this analysis technique is adjusted to the characteristics of the study, which is development research in the limited trial stage with a relatively small number of subjects ($N = 13$), so the analysis focused on the overall trend of score changes.

Therefore, the non-parametric Wilcoxon Signed Rank Test was used for further analysis. The Wilcoxon Signed Rank Test was conducted to measure learning motivation before and after the implementation of the learning model. The Wilcoxon Signed-Rank Test was selected because the study involved paired pretest-posttest data with a relatively small sample size. Although the normality test indicated normal data distribution, the use of a non-parametric test was considered more appropriate for maintaining analytical robustness during the limited trial stage. Nevertheless, the statistical findings should be interpreted cautiously because the small sample size limits broader statistical generalization. Therefore, the results are intended to provide preliminary evidence

regarding the model's potential effectiveness rather than definitive conclusions. The results are presented in Table 6.

Table 6. Results of the Wilcoxon Signed-Rank Test

<i>Variable</i>	<i>N</i>	<i>Z</i>	<i>Asymp. Sig. (2-tailed)</i>
Posttest-pretest	13	-496	0.620

The Wilcoxon test results show a Z value of -496 with an Asymp. Sig. (2-tailed) value of 0.620 (>0.05). This finding indicates a small change between the pre-test and post-test learning motivation scores. Although the Wilcoxon Signed Rank Test results show that the value has not reached the statistical significance level ($p>0.05$), this condition may be due to the limitations of the study at the limited testing stage, namely the number of samples $N=13$ and the short duration of implementation. However, if the results of the descriptive analysis and statistical values are synthesized, the SDT-based humanistic vocational learning model shows potential effectiveness at the level of the learning process, namely in the quality of interaction, involvement and distribution of motivation in students.

Although this study involved a limited number of vocational students, the developed learning model shows potential for broader application in vocational education settings. The use of collaborative learning activities, supportive teacher facilitation, and flexible learning design may support its implementation in larger classroom contexts. In addition, the model emphasizes the fulfillment of students' psychological needs for autonomy, competence, and relatedness, which may help support long-term learning motivation and engagement. Through active participation, reflective activities, and meaningful learning experiences, the model may also encourage self-regulated learning among vocational students. However, this study was conducted within a limited implementation period and involved a small sample size. Therefore, further studies involving larger and more diverse participants are recommended to examine the scalability, sustainability, and long-term effectiveness of the developed learning model.

Conclusion

This study concludes that the humanistic vocational learning model based on Self-Determination Theory (SDT) shows potential effectiveness in enhancing students' learning motivation in vocational education. The implementation of this model successfully supports the fulfillment of three basic psychological needs: autonomy, competence, and relatedness, which contribute to increased student engagement and motivation. Empirical findings suggest potential improvement in student learning motivation and engagement during the implementation process. This model not

only facilitates the development of technical competence but also fosters independent, confident, and socially connected students.

This study contributes to the development of vocational education by providing a structured and contextualized learning model that integrates SDT principles into classroom practice. These findings offer practical implications for educators in designing more student-centered and psychologically supportive learning environments. However, this study is limited by its small sample size and implementation in a single vocational school. Therefore, future research is recommended to involve a larger and more diverse sample and explore the integration of digital learning technologies to strengthen the model's effectiveness and scalability.

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