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Improving Vocational High School Students' Learning Motivation Through Digital-Based Interactive Learning Models

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Abstract: This study aimed to improve the learning motivation of vocational high school (SMK) students through the implementation of a digital-based interactive learning model. The research was motivated by the low level of student participation, passive classroom behavior, and the tendency of students to use smartphones for non-academic purposes during lessons. This Classroom Action Research (CAR) was conducted in two cycles involving 30 tenth-grade vocational high school students. Data were collected through observation, questionnaires, and documentation and analyzed using quantitative and descriptive qualitative techniques. The results indicated a significant improvement in students' learning motivation. The percentage of students categorized as having high learning motivation increased from 60% in Cycle I to 83.3% in Cycle II, exceeding the success indicator of 75%. Students also demonstrated greater participation, confidence, enthusiasm, and engagement during learning activities. The findings suggest that digital-based interactive learning effectively transforms smartphone use into productive learning tools and creates a more active, student-centered, and enjoyable learning environment. This study contributes practical evidence regarding the effectiveness of digital interactive learning in enhancing motivation among vocational high school students.

Keywords: *Digital Learning, Interactive Learning, Learning Motivation, Vocational Education, Classroom Action Research.*

A. Introduction

Learning motivation is a critical factor determining student success in Vocational High Schools (SMK), which inherently focus on job readiness and practical skills. Students with high learning motivation demonstrate active participation, deep material comprehension, and optimal learning outcomes. Conversely, low motivation leads to passivity, boredom, and suboptimal achievements. In reality, many vocational classrooms still rely on conventional, one-way lecture methods that isolate students from active engagement (Peng et al., 2022). Even though current students are digital natives who utilize smartphones and the internet daily, their devices are frequently misused for non-academic activities during class rather than supporting their education.

This issue underscores a clear disconnect between the students' digital habits and the school's teaching methods (Torres et al., 2024). Therefore, this study is motivated by the urgent need to bridge this gap through innovative pedagogical approaches, specifically by implementing a digital-based interactive learning model. By integrating multimedia

presentations, animated videos, and digital quizzes, this model aims to transform passive classrooms into dynamic, student-centered environments that naturally stimulate students' enthusiasm and technical curiosity.

Previous researchers have widely investigated the integration of technology in education to address shifting student demographics (Zhu, 2023). Digital learning media plays an essential role in capturing student attention by combining text, audio, and visual elements (Al-Muttairi & Al-Alusi, 2025). This multi-sensory approach aligns with the core principles of multimedia learning, which states that students learn more deeply from words and pictures combined than from words alone (Mohammed Cherif, 2024). When classroom environments shift from teacher-centered to student-centered, active participation increases significantly (Mukhtarova, 2026). Furthermore, the application of digital gamification, such as interactive quizzes, provides immediate feedback that fosters a competitive yet enjoyable learning atmosphere (Saleem et al., 2022).
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In a broader educational context, modern learning theories heavily support technology-driven pedagogy (Sain et al., 2025). According to constructivist theory, meaningful learning occurs when students actively construct their own knowledge through experience rather than passively receiving information (Zajda, 2021). Digital tools serve as a catalyst for this cognitive construction by offering interactive simulations and independent problem-solving platforms (Lin et al., 2022). Previous empirical studies have confirmed that mobile-assisted learning substantially boosts learner autonomy and self-regulated learning behaviors (Lei et al., 2022). Moreover, the integration of interactive software in vocational training has been shown to reduce cognitive load while improving spatial and practical understanding (Sulisworo et al., 2024).

The presence of external stimuli, such as dynamic digital media, also acts as a powerful extrinsic motivator that can eventually trigger long-term intrinsic interest in the subject matter (Qiu, 2025). When digital platforms are well-structured, they encourage peer collaboration and online discussion, which further enriches the social constructivist learning experience (Shanzey & Zaheera, 2025). Recent research in Southeast Asian vocational contexts also indicates that digital integration successfully minimizes classroom absenteeism and elevates overall student satisfaction (Keo & Lan, 2025). Additionally, utilizing cloud-based educational applications allows teachers to monitor real-time student engagement, making interventions timely and precise (Gautam & Kotiyal, 2024).

Although many studies have investigated digital learning media and technology integration in education, most research focuses on higher education or general secondary education contexts. Limited studies specifically examine how digital-based interactive learning can improve learning motivation among vocational high school students through classroom action research. Moreover, previous studies tend to emphasize academic achievement and learning outcomes rather than students' motivational development. Therefore, this study addresses this gap by investigating the effectiveness of a digital-based interactive learning model in improving learning motivation in vocational education settings.

Despite the extensive literature on digital media, a distinct research gap remains. Most previous studies focus generally on secondary or higher education platforms, often overlooking the unique ecosystem of Vocational High Schools (SMK) that demand a delicate balance between theoretical knowledge and instant practical application. Furthermore,

there is limited action-based research exploring how digital interactive models can specifically redirect students' existing smartphone distractions into constructive learning motivation within a classroom setting. This study directly addresses this gap by conducting a Classroom Action Research (CAR) to evaluate the design, execution, and direct impact of a digital-based interactive learning model tailored specifically for SMK students.

B. Methods

This study was designed as an action-based study using the Classroom Action Research (CAR) method. The main characteristic of this research is a practical and systematic intervention carried out directly by the teacher within the classroom environment to improve the quality of learning in a real context (Mallillin, 2022). Therefore, this study is not categorized as a laboratory experimental study, simulation study, or review study.

The research was conducted cyclically, where each cycle consisted of four interconnected stages:

1. **Planning**
   At this stage, the researcher prepared learning instruments (lesson modules), digital-based learning media, observation sheets, and students' learning motivation questionnaires.
2. **Action**
   The teacher implemented the digital-based interactive learning model in the classroom according to the prepared lesson plan.
3. **Observation**
   During this stage, the researcher observed and recorded students' activities, participation, attention during learning, and behavioral changes throughout the teaching and learning process.
4. **Reflection**
   The reflection stage was conducted to evaluate the implemented actions and to identify improvements for the following cycle in order to enhance the learning process.

Before implementation, the observation sheets and learning motivation questionnaires were reviewed by educational experts to ensure content validity. Data credibility was strengthened through triangulation of observation, questionnaire results, and documentation obtained during the research process.

Several basic assumptions and research conditions were established in this study, including:

1. Each student had access to a personal smartphone connected to the internet.
2. The classroom had adequate electrical facilities and a stable internet/Wi-Fi connection to support digital learning activities.
3. The teacher acted directly as both the implementer of the learning activities and the observer of the classroom process.
4. The study was based on Constructivism Theory, which emphasizes that students actively construct knowledge through direct experience and interaction with the learning environment (digital media), rather than passively receiving information.

The subjects of this study were 30 tenth-grade students of a vocational high school (SMK) with different learning characteristics and abilities. The selection of the subjects was based on preliminary observations indicating low learning motivation, lack of enthusiasm, passive classroom behavior, and students' tendency to use smartphones for non-learning activities during lessons (Jiaming, 2023).

The object of this study focused on students' learning motivation, classroom participation, discussion involvement, and students' responses after the implementation of the digital-based interactive learning model.

To ensure research reproducibility, the following hardware and software specifications along with their brand names were used during the study.

Hardware

1. **Teacher's Laptop:** ASUS Vivobook 14 (AMD Ryzen 5 Processor, 8GB RAM, Windows 11 Operating System) used as the primary instructional control device.
2. **Visual Projection System:** Epson EB-X06 XGA 3600-Lumen projector used to display interactive learning materials on the classroom screen.
3. **Students' Interaction Devices:** Students' personal smartphones from various brands using Android OS version 10 or higher or iOS version 14 or higher.

Software

1. **Gamification and Evaluation Platform:** Quizizz Premium Edition accessed through mobile web browsers for conducting real-time interactive quizzes.
2. **Instructional Design Media:** Canva Pro for Education used to design multimedia presentations, animations, and instructional visualizations.
3. **Data Analysis Tool:** Microsoft Excel 2021 used for data tabulation, percentage calculations, and descriptive qualitative analysis.

Data Analysis Techniques and Success Indicators

Data analysis was conducted using both quantitative and qualitative descriptive approaches.

1. **Quantitative Data Analysis**
   Quantitative data were obtained from students' learning motivation questionnaires before and after the implementation of the action (Hasan et al., 2021). The data were analyzed using percentage calculations to determine the improvement in students' learning motivation in each cycle (Chen, 2022). The results were presented in tables and percentages.
2. **Qualitative Data Analysis**
   Qualitative data were obtained from classroom observation sheets during the learning process (Pahome, 2023). The data were analyzed descriptively to explain students' behavioral changes, participation levels, and responses toward the implemented learning model.
3. **Success Indicators**
   The study was considered successful if at least 75% of students achieved the high learning motivation category (Asvio, 2022). In addition, success was also indicated by increased student participation, classroom interaction, learning attention, and positive responses toward the use of digital media (Gopinathan et al., 2022). If these indicators were not achieved in the first cycle, the study would continue to the next cycle.

C. Results and Discussion

Results

This classroom action research was conducted in two cycles involving 30 students of class X at a vocational high school (SMK). The study aimed to improve students' learning motivation through the implementation of a digital-based interactive learning model. Data were collected through observation, questionnaires, and documentation during the learning process.

In the first cycle, the learning process was carried out using interactive digital media such as multimedia presentations, learning videos, and simple digital quizzes. The implementation of digital-based learning began to show positive changes in students' participation and enthusiasm during classroom activities.

Based on classroom observations, several students showed greater interest in learning activities compared to previous conventional learning methods. Students appeared more focused when learning videos and interactive presentations were used. In addition, digital quizzes encouraged students to participate more actively in classroom discussions. However, some students were still passive and less confident in expressing opinions or asking questions during the lesson.

The results of the learning motivation questionnaire in Cycle I indicated an improvement compared to the initial condition before the action was implemented. Students became more enthusiastic in participating in the lesson and paid more attention to the teacher's explanation. The results of students' learning motivation in Cycle I are presented in Table 1.

Table 1. Students' Learning Motivation in Cycle I

Motivation Category	Number of Students	Percentage
High	18	60%
Moderate	8	26.7%
Low	4	13.3%

The results showed that the success indicator had not yet been achieved because the percentage of students with high learning motivation was still below the target of 75%. Therefore, the study was continued to Cycle II with several improvements in the learning process.

In Cycle II, improvements were made by increasing student interaction through more attractive learning videos, interactive digital quizzes, group discussions, and broader opportunities for students to participate actively during classroom activities.

Observation results showed a significant improvement in student participation and learning motivation. Students became more active in asking questions, participating in discussions, and responding to the teacher's instructions. The classroom atmosphere also became more interactive and enjoyable.

The results of the learning motivation questionnaire in Cycle II showed a significant increase compared to Cycle I.

Table 2. Students' Learning Motivation in Cycle II

Motivation Category	Number of Students	Percentage

High	25	83.3%
Moderate	4	13.3%
Low	1	3.4%

The results indicate that the success criteria of the study were achieved because more than 75% of students reached the high motivation category. In addition to the increase in learning motivation, classroom observations also revealed several positive changes, including:

1. Students became more active during learning activities.
2. Student participation in discussions increased.
3. Students were more confident in asking questions and expressing opinions.
4. Students showed greater interest in learning materials.
5. The learning atmosphere became more interactive and enjoyable.

Table 3. Improvement of Learning Motivation

Cycle	High	Moderate	Low
Cycle I	60%	26.7%	13.3%
Cycle II	83.3%	13.3%	3.4%
Improvement	+23.3%	-13.4%	-9.9%

Discussion

The findings of this study indicate that the implementation of a digital-based interactive learning model successfully improved students' learning motivation in vocational high school classrooms. The improvement was evident from the observation results, questionnaire data, and students' behavioral changes during the learning process. Before the implementation of the action, students' learning motivation was relatively low. Most students tended to be passive during classroom activities and only listened to the teacher's explanation without actively participating in the learning process. Some students were less focused during lessons and showed little enthusiasm toward completing learning tasks. These conditions made the learning process less effective and reduced students' engagement in classroom activities.

The low level of learning motivation was influenced by the use of conventional teaching methods that relied mainly on one-way lectures. Such learning conditions often make students feel bored because they are not actively involved in the learning process. According to Sardiman, learning motivation can decrease when the classroom atmosphere is monotonous and less engaging for students.

The implementation of a digital-based interactive learning model became an alternative solution to overcome these problems. In this study, digital learning media such as learning videos, multimedia presentations, and interactive quizzes were used to increase student involvement during classroom activities. The use of digital media created a more attractive and modern learning environment that suited the characteristics of current students who are closely connected with technology in their daily lives.

During Cycle I, students began to show positive responses toward the learning activities. Learning videos and interactive presentations attracted students' attention and helped

them focus more on the learning materials. Interactive quizzes also increased students' interest because they allowed students to participate directly in learning activities through technology-based interaction.

However, several obstacles were still found in Cycle I. Some students were still passive and lacked confidence in expressing their opinions or asking questions. This condition occurred because students were still adapting to the new learning model. In addition, some students were not yet accustomed to collaborative and interactive learning activities.

Although the success criteria had not yet been achieved in Cycle I, the findings indicated an improvement in students' motivation compared to the initial condition. Therefore, improvements were made in Cycle II by increasing student interaction, using more varied digital media, and providing more opportunities for active participation. The results of Cycle II demonstrated a significant increase in students' learning motivation. Students became more enthusiastic, active, and confident during the learning process. They participated more actively in discussions, answered questions enthusiastically, and showed greater interest in learning activities.

The increase in learning motivation in Cycle II indicates that digital-based interactive learning can create a more student-centered learning environment. Students were no longer passive recipients of information but became active participants in constructing knowledge through interactive learning experiences.

These findings are consistent with constructivist learning theory, which emphasizes that meaningful learning occurs when students actively construct their own understanding through experience and interaction. In this study, students were actively involved in observing videos, participating in digital quizzes, discussing learning materials, and interacting with classmates during classroom activities. As a result, students gained more meaningful learning experiences.

The increase of 23.3% in the high-motivation category demonstrates that digital interactive learning not only attracts students' attention but also sustains their engagement throughout the learning process. Interactive quizzes, multimedia presentations, and video-based instruction provide immediate feedback and meaningful learning experiences, which are important components in fostering student motivation. These findings reinforce previous studies emphasizing that technology-enhanced learning environments contribute positively to learner engagement and participation.

The findings of this study also support the opinion of (Laksmi et al., 2021) who stated that digital learning media can improve students' attention and interest because learning materials are presented through combinations of images, text, sound, and animation. The use of multimedia elements in learning makes the material easier to understand and more interesting for students.
Furthermore, the results are in line with the findings of (Wibowo et al., 2023), who explained that technology-based learning can improve student participation and classroom interaction. In this study, students became more active and engaged after the implementation of interactive digital learning. Another important finding of this study is that digital-based learning not only improved students' motivation but also created a more enjoyable learning atmosphere. Students appeared more enthusiastic because the learning

process was no longer monotonous. Interactive media such as videos and quizzes made classroom activities more dynamic and engaging.

Nevertheless, several challenges were encountered during the implementation of the learning model. One of the main obstacles was unstable internet connectivity, which occasionally disrupted the use of digital learning media. In addition, students had different levels of technological skills, requiring teachers to provide additional guidance for some students.

Another challenge was the need for teachers' readiness in managing digital-based learning effectively. Teachers are required to master educational technology and create engaging learning media to ensure successful learning implementation. Therefore, teachers need continuous improvement in technological competence and creativity in developing interactive learning activities.

Overall, the results of this study demonstrate that the digital-based interactive learning model is effective in improving students' learning motivation in vocational high school education. The learning model successfully created an active, interactive, and enjoyable classroom atmosphere, which encouraged students to participate more actively in the learning process. Increased learning motivation ultimately contributed to a more effective learning process and better achievement of learning objectives.

D. Conclusions

This study concludes that the implementation of a digital-based interactive learning model effectively improves vocational high school students' learning motivation. The percentage of students with high learning motivation increased from 60% in Cycle I to 83.3% in Cycle II, indicating that the success criterion was achieved. The use of multimedia presentations, learning videos, and interactive digital quizzes successfully increased students' participation, confidence, and enthusiasm during classroom learning. Therefore, digital-based interactive learning can serve as an innovative strategy for creating student-centered learning environments and improving learning motivation in vocational education. Future studies are recommended to involve larger samples and investigate the long-term effects of digital interactive learning on academic achievement and learning outcomes.

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References

Al-Muttairi, F. Z. S., & Al-Alusi, A. (2025). Multimodal communication in ESL learning:

Examining the integration of visual, auditory, and textual elements in digital media with a focus on quality Education (SDG 4). *Journal of Lifestyle and SDGs Review*, *5*(3), e04773–e04773.

Asvio, N. (2022). *The influence of learning motivation and learning environment on undergraduate students' learning achievement of management of Islamic education, study program of IAIN Batusangkar In 2016*.

Chen, J.-C. (2022). Developing a cycle-mode POED model and using scientific inquiry for a practice activity to improve students' learning motivation, learning performance, and hands-on ability. *Interactive Learning Environments*, *30*(7), 1252–1264.

Gautam, A., & Kotiyal, A. (2024). Connecting the future: cloud-based IoT in education. In *Integration of cloud computing and IoT* (pp. 274–308). Chapman and Hall/CRC.

Gopinathan, S., Kaur, A. H., Veeraya, S., & Raman, M. (2022). The role of digital collaboration in student engagement towards enhancing student participation during COVID-19. *Sustainability*, *14*(11), 6844.

Hasan, H., Dedi Hermanto Karwan, D., Een, Y. H., Riswanti, R., & Ujang, S. (2021). Motivation and learning strategies student motivation affects student learning strategies. *Despite Being a Popular Research Subject Internationally, Self-Regulated Learning Is Relatively under-Investigated in the Indonesian Context. This Article Examined Student Learning Motivation and Its Use as an Indicator to Predict Student Learning Strateg*, *10*(1), 39–49.

Jiaming, N. (2023). *A study on the learning engagement status and influencing factors of university students in a smart classroom environment: A case study of a smart classroom at Baise University*.

Keo, V., & Lan, B. (2025). Exploring Educational Technology Integration In Cambodian Higher Education: Challenges And Opportunities. *Higher Education*, *4*(02).

Laksmi, N. K. P., Yasa, I. K. A., & Mirayani, K. A. M. (2021). The use of animation video as learning media for young learners to improve EFL students' motivation in learning English. *Lingua*, *17*(1), 42–52.

Lei, X., Fathi, J., Noorbakhsh, S., & Rahimi, M. (2022). The impact of mobile-assisted language learning on English as a foreign language learners' vocabulary learning attitudes and self-regulatory capacity. *Frontiers in Psychology*, *13*, 872922.

Lin, P.-C., Hou, H.-T., & Chang, K.-E. (2022). The development of a collaborative problem solving environment that integrates a scaffolding mind tool and simulation-based learning: An analysis of learners' performance and their cognitive process in discussion. *Interactive Learning Environments*, *30*(7), 1273–1290.

Mallillin, L. L. D. (2022). Teaching and learning intervention in the educational setting: adapting the teacher theory model. *International Journal of Educational Innovation and Research*, *1*(2), 99–121.

Mohammed Cherif, D. (2024). *The Use of the Multi-Sensory Teaching Approach in Enhancing Vocabulary Learning for EFL Young Learners*. Université Kasdi Merbah-Ouargla.

Mukhtarova, S. (2026). The Role Of Teacher-Centered And Student-Centered Approaches In Effective Teaching. *Образование Наука И Инновационные Идеи В Мире*, *86*(1), 63–69.

Pahome, D. (2023). Observation Sheet--An Essential Tool for Facilitating Learning. *Romanian Review of Geographical Education*, *12*, 5–16.

Peng, L., Jin, S., Deng, Y., & Gong, Y. (2022). Students' perceptions of active learning classrooms from an informal learning perspective: building a full-time sustainable learning environment in higher education. *Sustainability*, *14*(14), 8578.

Qiu, Y. (2025). Intrinsic and Extrinsic Motivation in Remote Learning. *SHS Web of*

Conferences, *222*, 4006.

Sain, Z. H., Thelma, C. C., & Sain, S. H. (2025). Tech-driven teaching: Analyzing academic research on educational integration of technology. *International Journal of Higher Education Management*, *11*(1).

Saleem, A. N., Noori, N. M., & Ozdamli, F. (2022). Gamification applications in E-learning: A literature review. *Technology, Knowledge and Learning*, *27*(1), 139–159.

Shanzey, P., & Zaheera, Z. (2025). The Effectiveness of Online Collaborative Learning through Digital Platforms in Enhancing Students' Communication Skills. *International Journal of Curriculum Development, Teaching and Learning Innovation*, *3*(3), 110–119.

Sulisworo, D., Erviana, V. Y., & Robiin, B. (2024). Application of cognitive load theory in VR development and its impact on learning: A perspective on prior knowledge, learning interest, engagement, and content comprehension. *JOIV: International Journal on Informatics Visualization*, *8*(2), 874–881.

Torres, R. L., Solivio, C. J., Torres, D. D., & Torres, S. (2024). Exploring the Digital Habits and Lifestyles of High School Students Towards the Development of a Digital Wellbeing Framework. *International Journal of Research and Scientific Innovation, XI (XV)*, 234–244.

Wibowo, G. A., Karim, A. A., Hasan, S. H., & Ruhimat, M. (2023). Use of Technology in Active Learning: Increasing Student Interaction and Engagement. *Al-Hijr: Journal of Adulearn World*, *2*(4).

Zajda, J. (2021). Constructivist learning theory and creating effective learning environments. In *Globalisation and education reforms: Creating effective learning environments* (pp. 35–50). Springer.

Zhu, A. (2023). Navigating the digital shift: The impact of educational technology on pedagogy and student engagement. *Journal of Education and Educational Research*, *6*(1), 11–14.