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DEVELOPMENT OF SHORT VIDEO COURSES IN VOCATIONAL EDUCATION

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Abstrak
Perkembangan industri digital telah mengubah kebutuhan kompetensi lulusan pendidikan vokasi sehingga diperlukan pengembangan mata kuliah yang selaras dengan tuntutan dunia kerja. Namun, sebagian besar penelitian sebelumnya masih berfokus pada pengembangan media pembelajaran atau peningkatan kompetensi tertentu, sementara pengembangan mata kuliah secara komprehensif berbasis kebutuhan industri masih terbatas. Penelitian ini bertujuan mengembangkan mata kuliah *Short Video* berbasis kebutuhan industri menggunakan model ADDIE serta menguji validitas, reliabilitas, dan efektivitasnya dalam meningkatkan hasil belajar dan kreativitas mahasiswa. Data dianalisis melalui paired & independent sample t-test dan ukuran efek Cohen's d. Hasil penelitian menunjukkan bahwa mata kuliah yang dikembangkan memiliki tingkat validitas dan reliabilitas yang tinggi serta secara signifikan meningkatkan learning outcomes dan creativity mahasiswa dibandingkan pembelajaran konvensional. Temuan penelitian juga menunjukkan bahwa integrasi kebutuhan industri ke dalam keseluruhan proses desain pembelajaran, mulai dari analisis kebutuhan, pengembangan sumber belajar, implementasi pembelajaran, hingga evaluasi produk, menghasilkan pengalaman belajar yang lebih autentik dan relevan dengan dunia kerja. Penelitian selanjutnya dapat mengimplementasikan model pengembangan mata kuliah berbasis kebutuhan industri ini pada berbagai bidang keahlian pendidikan vokasi serta mengevaluasi dampak jangka panjangnya terhadap kompetensi lulusan dan kesiapan kerja di dunia industri.

Kata Kunci: ADDIE; Hasil Belajar; Kreativitas; Pendidikan Vokasi

Abstract
The development of the digital industry has transformed the competency requirements for vocational education graduates, making it necessary to develop courses that align with the demands of the workforce. However, most previous research has focused on the development of learning media or the enhancement of specific competencies, while comprehensive course development based on industry needs remains limited. This study aims to develop a Short Video course based on industry needs using the ADDIE model and to test its validity, reliability, and effectiveness in improving students' learning outcomes and creativity. Data were analyzed using paired and independent sample t-tests and Cohen's d effect size. The results show that the developed course has high levels of validity and reliability and significantly improves students' learning outcomes and creativity compared to conventional learning methods. The research findings also indicate that integrating industry needs into the entire instructional design process—from needs analysis and the development of learning resources to instructional implementation and product evaluation—results in a learning experience that is more authentic and relevant to the workplace. Future research could apply this industry-needs-based course development model to various fields of vocational education and evaluate its long-term impact on graduates' competencies and job readiness in the industry.

Keywords*: ADDIE; Learning Outcomes; Creativity; Vocational Education*

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INTRODUCTION

Digital transformation has changed the way various industrial sectors operate while creating new demands for human resource competencies in the digital economy era. The development of digital technology, artificial intelligence, data analysis, and platform-based industrial ecosystems has changed the characteristics of work, meaning that graduates are no longer required to master only technical skills, but are also expected to possess digital competence, adaptability, collaboration, creativity, and problem-solving skills to face the increasingly dynamic world of work (Anisimova & Efremova, 2022; Kovalchuk et al., 2023). These changes indicate that graduate success in the workplace is increasingly determined by the ability to integrate technological knowledge with thinking, communication, and adaptation skills in response to industrial developments. Therefore, educational institutions no longer function only as providers of knowledge, but also as developers of learning environments that can facilitate the development of competencies relevant to the needs of the digital workplace (Irfan et al., 2026; Sari et al., 2025). This condition places vocational education in a strategic position to prepare graduates who are able to respond to industrial transformation through curriculum development and learning experiences that are aligned with future competency needs. In line with this, vocational education needs to integrate technical, digital, and adaptive competencies into the learning process so that graduates have work readiness that is relevant to technological developments and the needs of the digital industry (Damien & Pierre, 2026). Therefore, the transformation of vocational education cannot be said to require only the use of technology in the learning process, but also the continuous alignment of curriculum, instructional design, and competency development to improve graduate readiness to face changes in the work environment.

One of the sectors experiencing the most rapid transformation as a result of the development of the digital economy is the media and entertainment industry, which has developed from merely being a form of entertainment into an important part of the digital communication, marketing, education, and creative industry ecosystems. These developments have changed the characteristics of work in the digital media sector, meaning that industry needs are no longer limited to content production skills, but also include competencies in user analysis, data-based content management, the use of digital technology, and the development of creative business strategies. This change places the Media Convergence Technology and Operations program in an increasingly strategic position because it is required to produce graduates who integrate technical, operational, and creative competencies in accordance with the dynamics of the digital industry. Therefore, the development of vocational education curricula needs to be directed toward equipping students with communication, collaboration, creativity, adaptability to technology, and work readiness in accordance with industry needs (Hidayatulloh & Ashoumi, 2022; Nurjanah et al., 2022). In line with this, aligning the curriculum with labor market needs is becoming increasingly important because higher education institutions are not only required to produce academically competent graduates, but also graduates with professional readiness to face changes in the characteristics of work (Wahyuningsih et al., 2026).

Although vocational education has attempted to adapt its curriculum to developments in the digital industry, the implementation of learning still faces various challenges in producing graduates who truly meet the needs of the workplace. Various studies have shown that one of the main challenges in vocational education is the continuing gap between graduate competencies and job requirements, which affects low work readiness and graduate absorption in industry (Daryono et al., 2023; Fauzan et al., 2023). In addition, students' work readiness is not only influenced by mastery of technical competencies, but also by learning experiences that are able to connect theoretical knowledge with industry practices through authentic and contextual learning (Suroto et al., 2024).

To address these problems, various learning innovations have been developed to improve students' competencies and work readiness; however, most of them still focus on the development of learning media, the use of digital technology, or the improvement of specific competency aspects. In fact, the development of vocational education needs to consider the relationship between curriculum, labor market skill needs, and learning implementation as an integrated system in order to respond to changing industry needs continuously (McGrath & Yamada, 2023). Therefore, further research is still needed to develop courses comprehensively based on industry needs so that the processes of curriculum design, learning resource development, learning implementation, and product evaluation can be integrated within a single instructional design framework.

To address this research gap, a development approach is needed that is able to design courses comprehensively based on industry needs. Such development requires systematic instructional design so that needs analysis, the formulation of learning outcomes, material development, learning activities, assessment strategies, and product evaluation become an integrated and interconnected whole. Various studies have shown that the ADDIE model is an effective development framework because it provides a systematic procedure for aligning learning objectives, developed competencies, learning implementation, and continuous evaluation, so that the resulting product is more relevant to learner characteristics and professional needs. In the context of vocational education, this approach also allows industry needs to be integrated into each stage of development so that learning is not only oriented toward academic achievement, but also toward competencies that are genuinely required in the workplace (Rahmawati et al., 2026). Therefore, the development of an industry needs-based course using the ADDIE model is considered an approach capable of bridging the gap between curriculum, learning processes, and industry demands through a systematic, contextual, and continuous development process.

Based on these research problems and gaps, this study aims to develop an industry needs-based Short Video course using the ADDIE model and to evaluate the quality of the resulting course based on its validity, reliability, and implementation effectiveness in terms of students' learning outcomes and creativity. The novelty of this study lies in the comprehensive development of a course that begins with an analysis of industry needs and is then translated into curriculum design, learning resource development, learning implementation, and product evaluation within a systematic development process. Unlike previous studies that generally focus on developing learning media or improving specific competencies, this study places industry needs as the main foundation throughout the instructional design process. This study is expected to contribute to the development of Educational Technology, particularly in the development of industry needs-based courses in vocational education, while also providing a development model that can serve as a reference for higher education institutions in designing learning that is more adaptive to technological developments and the needs of the workplace.

METHOD

This study employed a Research and Development (R&D) approach aimed at developing a Short Video course for the Media Convergence Technology and Operations program and evaluating its effectiveness in improving students' competencies. The product development process adopted the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. After the course was fully developed, its effectiveness was tested using a quasi-experimental design with a pretest-posttest nonequivalent control group design. At this stage, the students were divided into an experimental group that participated in learning using the developed course and a control group that participated in learning using a conventional approach.

Measurements were conducted before and after implementation to evaluate changes in students' learning outcomes and creativity after participating in the learning process.

This study was conducted through the five stages of the ADDIE model, namely Analysis, Design, Development, Implementation, and Evaluation. The Analysis and Design stages focused on identifying industry needs and designing a competency-based course structure as the foundation for product development. The Development stage produced learning resources, practical learning materials, and evaluation instruments, which were subsequently validated before being implemented with students during the Implementation stage. The Evaluation stage was conducted through an analysis of implementation results, feedback from stakeholders, and product refinement to produce a course that was more aligned with the needs of vocational education and industry demands.

The participants in this study consisted of 60 second-semester students from the 2023 cohort of the Media Convergence Technology and Operations program at Qufu Far East Vocational and Technical College. The sample was selected using purposive sampling, with the criterion that participants had completed prerequisite courses related to digital image processing and basic editing techniques, thereby possessing sufficient initial competencies to participate in short video development learning.

The research data were collected using skill tests and rating scales designed to measure students' learning outcomes and creativity. The research instruments consisted of instruments measuring technical competence, operational competence, and creativity, which included aspects of content originality, technical innovation, and commercial value. All instruments were developed based on course standards, industry competency requirements, and the characteristics of short video learning. The details of the variables, measured aspects, indicators, instruments, and measurement scales used in this study are presented in Table 1.

Table 1 Research Variables, Aspects, Indicators, and Measurement Scales

Variable	Aspect	Item Indicator	Likert Scale	Number of Item
Learning Outcomes	Technical competence	Filming, editing, special effects	0–10	15
	Operational competence	Topic planning, platform distribution, data review		5
Creativity	Content originality	Novelty of topics, narrative perspective	1–5	10
	Technical innovation	AIGC utilization, special effects		5
	Commercial value	Product placement, conversion prediction, fan growth potential		5

All instruments were developed and validated before being used in the study. The content validity of the instruments was evaluated by three industry experts and two educational technology experts using the Content Validity Index (CVI). Subsequently, the instruments were piloted with students outside the research sample to examine internal consistency, resulting in Cronbach's α reliability coefficients ranging from 0.83 to 0.91. These results indicate that all instruments met the criteria for validity and reliability and were therefore suitable for measuring students' technical competence, operational competence, and creativity in this study.

The research data were analyzed according to the stages of the ADDIE development model. Data obtained from the Analysis and Design stages were analyzed descriptively to identify industry needs and formulate the course design. At the Development stage, the validity and reliability of the instruments were analyzed using the Content Validity Index (CVI) and Cronbach's α coefficient to ensure the suitability of the instruments before they were used in the study. Subsequently, at the Implementation stage, the data were first tested for normality and homogeneity as prerequisites for

statistical analysis. An independent samples t-test was used to examine the initial equivalence between the experimental and control groups based on pretest scores, while a paired samples t-test was used to analyze improvements in learning outcomes and creativity within each group. The effectiveness of the product was further analyzed using an independent samples t-test on the posttest scores to compare learning outcomes between the experimental and control groups, followed by the calculation of the effect size using Cohen's d to determine the magnitude of the effect of using the developed product. At the Evaluation stage, the implementation results were used as the basis for refining the product based on feedback from industry partners, followed by final verification of the developed product.

RESULT

The Analysis and Design phases were conducted to identify industry needs through a survey of 100 MCN companies, interviews with 10 experts, and an analysis of digital content trends. These phases yielded three primary graduate competencies—technical, operational, and creative—which served as the foundation for structuring a real-project-based course comprising five modules and a three-dimensional assessment system. The Development phase realized this blueprint into instructional materials (Short Video Planning Template, AIGC Tool Application Guide, and an Enterprise Project Case Library containing 10 case studies), practice facilities (a green screen virtual simulation studio and a real-time data analysis platform), as well as six assessment instruments validated by three industry experts and two educational technology specialists. The validation results indicated that the developed learning resources applied in the course exhibited excellent content validity, with a Content Validity Index (CVI) of 0.92. Preliminary testing on 30 students outside the research sample yielded Cronbach's α reliability coefficients ranging from 0.83 to 0.91, demonstrating that all instruments met the criteria for reliability. Furthermore, practicality testing revealed that 87% of students agreed the developed learning resources successfully reduced learning difficulties and possessed high relevance to practical industry needs. The Implementation phase was carried out to apply the developed course to the experimental group and evaluate its effectiveness through a 16-week instructional delivery.

Table 2. Descriptive Statistics of Course Implementation Results

Data	Group	Mean	Standard Deviation
Learning Outcome Pre-Test	Experiment	161,50	5,29
	Control	160,26	6,67
Learning Outcome Post-Test	Experiment	183,26	7,34
	Control	165.76	6,96
Creativity Pre-Test	Experiment	68,16	6,87
	Control	67,76	5,64
Creativity Post-Test	Experiment	86,93	6,32
	Control	75,46	5,.91

Table 2 illustrates that both groups possessed relatively comparable average pre-test scores across both learning outcomes and creativity variables. Following the instructional implementation, the experimental group's mean learning outcomes score increased from 161.50 to 183.26, whereas the control group's mean score increased from 160.26 to 165.76. Regarding the creativity variable, the experimental group's mean score rose from 68.16 to 86.93, while the control group's mean score rose from 67.76 to 75.46. These descriptive findings suggest that the score gain in the experimental group was higher than that in the control group. Nevertheless, statistical testing is required to confirm whether this difference is significant.

Prior to testing effectiveness, the data were subjected to assumption testing to ensure statistical compliance. Normality testing using the Shapiro-Wilk test yielded significance values ranging from

0.131 to 0.707, while homogeneity testing using Levene's Test produced significance values ranging between 0.159 and 0.884. As all significance values exceeded 0.05, the data were normally distributed and exhibited equal variances (homogeneity). Subsequently, an independent sample t-test was performed on the pre-test scores to verify baseline equivalence between the experimental and control groups. The test results are presented in Table 3.

Table 3. Initial Equality Test Results for Experimental Group and Control Group

Variable	T-test (2-sided) p
Learning Outcome Pre-Test	0,431
Creativity Pre-Test	0,806

Based on Table 3, no significant differences were observed between the experimental and control groups regarding pre-test learning outcomes ($p = 0.431$) or pre-test creativity ($p = 0.806$). These results indicate that both groups possessed equivalent initial abilities, rendering them suitable for evaluating the effectiveness of the developed course implementation. Furthermore, score improvements within each group were analyzed using a paired sample t-test, as presented in Table 4.

Table 4. Paired-Sample t-Test Results for Experimental and Control Groups

Variable	T-test (2-sided) p
Pre-test and Post-test for the Experimental Group	<0,001
Pre-test and Post-test for the Control Group	<0,001

The paired sample t-test results demonstrated that both the experimental and control groups experienced statistically significant score gains from pre-test to post-test ($p < 0.001$). Nonetheless, the improvement in the experimental group was markedly higher than that in the control group, as evidenced by the post-implementation mean differences in learning outcomes and creativity. Consequently, analysis proceeded with an independent sample t-test on the post-test scores to compare instructional effectiveness between the two groups.

Table 5. Results of Independent t-test Between Groups

Variable	T-test (2-sided) p	Cohen's d
Pre-test and Post-test for the Experimental Group	<0,001	2,44
Pre-test and Post-test for the Control Group	<0,001	1,87

The independent sample t-test results in Table 5 showed that the experimental group's post-test scores for both learning outcomes and creativity were significantly higher than those of the control group ($p < 0.001$). Cohen's d values of 2.44 for learning outcomes and 1.87 for creativity indicated a very large effect size. These findings demonstrate that the ADDIE-based course developed in this study was effective in enhancing student learning outcomes and creativity compared to conventional instruction.The Evaluation phase was executed to assess the implementation of the developed course through stakeholder feedback and to refine the product accordingly. The evaluation findings highlighted several course components requiring refinement to enhance implementation quality. Regarding course content, a module titled "Private Domain Operation" was added following input from 45% of industry partners who identified this competency as a critical workplace requirement. Additionally, content covering AIGC-based script optimization was expanded to address limitations in refining automatically generated content. Regarding instructional methods, the frequency of industry mentor coaching was increased from twice to four times per semester, and a peer review mechanism was incorporated for student project outputs. Meanwhile, the assessment scheme was augmented with objective indicators, namely user engagement rate and commercial conversion rate, integrated with the Douyin test platform. Consequently, the evaluation process shifted beyond pure academic metrics to encompass product performance within an industry context.Following these refinements, the final verification phase

showed an overall increase in learning product quality. Furthermore, industry partner satisfaction with student work increased from 78% to 89%, with 63% of industry partners expressing willingness to recruit graduates directly. Originality testing also revealed a similarity index of 18% for the learning resources, thereby satisfying established academic integrity standards. Overall, the Evaluation phase confirmed that the iterative assessment and refinement process successfully improved course quality, aligning the final deliverable with instructional needs and industry demands.

DISCUSSION

The findings of this study indicate that the development of children's logical operation skills in game-based learning is not determined by the presence of games themselves, but rather by the quality of the learning conditions that shape children's learning experiences during gameplay. The results demonstrate that the success of game-based learning depends on how play activities are designed, facilitated by teachers, supported by the learning environment, and structured to encourage children's active involvement in constructing their own knowledge. These findings are consistent with the perspective of constructivist learning theory, which positions game-based learning as a pedagogical approach whose effectiveness is determined by the process of knowledge construction through meaningfully designed learning experiences, rather than by the use of games alone (Pill et al., 2023). These findings also reinforce the results of a systematic review indicating that the effectiveness of digital game-based learning depends on the integration of game design, pedagogical strategies, and the teacher's role (Tay et al., 2022), and are consistent with various studies emphasizing that the quality of learning cannot be established through a single component in isolation, but requires the integration of teacher competence, student-centred pedagogical approaches, and adequate learning environment and infrastructure support (Chrishanty et al., 2025; Hilhamsyah et al., 2024; Sabariah et al., 2025). Thus, game-based learning should be viewed as a learning system that integrates various complementary pedagogical conditions to support the development of children's logical operation skills.

Games designed according to children's cognitive developmental characteristics and learning objectives provide opportunities for children to explore, test various problem-solving strategies, and gradually develop logical reasoning. However, this potential can only be optimally realized when supported by teacher guidance through appropriate directions, prompting questions, feedback, and scaffolding tailored to children's learning needs. These findings are consistent with Piaget's perspective, which positions play as a primary medium through which children construct knowledge through direct experience, while also reinforcing Vygotsky's perspective, which emphasizes the importance of adults in facilitating learning through interaction and guidance during play (Mauluddia & Solehuddin, 2023; Veraksa et al., 2022). Previous studies have also shown that the effectiveness of game-based learning is determined not only by the quality of game design, but also by the appropriate implementation of scaffolding and the alignment among game design, learning theory, and learning objectives (Hou et al., 2023; Ramli et al., 2022). Therefore, the findings of this study reinforce the view that the development of children's logical operation skills is determined more strongly by the integration of meaningful game design and adaptive pedagogical strategies employed by teachers than by the characteristics of the games themselves. Accordingly, learning quality should be understood as the result of interactions among various complementary pedagogical components (Yu et al., 2024).

A supportive learning environment and active child participation constitute learning conditions that strengthen the process of knowledge construction during game-based learning. The findings demonstrate that the learning environment should not be understood merely as the physical space in

which learning takes place, but also as encompassing psychological, social, cultural, and pedagogical dimensions that collectively shape children's learning experiences and enhance their motivation, engagement, and learning outcomes (Rusticus et al., 2023). In the context of game-based learning, a learning environment designed to encourage exploration, collaboration, dialogue, and reflection provides children with opportunities to develop logical understanding through active and meaningful learning experiences, consistent with the characteristics of game-based learning, which utilizes games as a means of creating interactive learning environments (Cabrera-Solano, 2022). Furthermore, active engagement in interactions with teachers and peers provides children with opportunities to test their reasoning, exchange ideas, and construct knowledge collaboratively, which are key characteristics of constructivist learning environments and contribute to the development of higher-order thinking skills (Do et al., 2023). This finding is further supported by research demonstrating that instructional designs that explicitly facilitate thinking and reasoning processes can enhance student engagement while enabling teachers to identify the development of logical thinking skills during learning activities (Peters-Burton et al., 2026). Conversely, providing students with opportunities to exercise control over aspects of their learning process has also been shown to enhance motivation and learning quality, making active child participation an important component in the development of logical operation skills (Hauk & Gröschner, 2022). These findings are also consistent with research emphasizing that an effective learning environment is constructed through the integration of classroom climate, resources, and learning conditions that support student well-being and engagement (Muñoz-Troncoso & Riquelme, 2025), while reinforcing the view that learning outcomes result from a combination of complementary instructional conditions (Dallavis & Berends, 2023). Therefore, the development of children's logical operation skills in game-based learning should be understood as the outcome of active engagement within a learning environment rich in interaction, collaboration, and opportunities for knowledge construction, which ultimately provides an important foundation for the development of reasoning skills required in 21st-century learning (Bronkhorst et al., 2022).

The findings of this study indicate that the development of children's logical operation skills in game-based learning results from the integration of various complementary learning conditions. These results suggest that the effectiveness of game-based learning is more appropriately understood as the product of the integration of game design, teacher guidance, learning environment support, and active child participation, which collectively shape meaningful learning experiences (Nafratilova & Degeng, 2025). This perspective is consistent with the student-centred experience approach, which positions the quality of learning experiences as the result of the integration of instructional design, educator roles, and learning implementation, while reinforcing the view that learning outcomes are influenced by a combination of instructional conditions rather than by a single learning component in isolation (Coleman & Money, 2024; Dallavis & Berends, 2023). These findings also extend existing research on game-based learning, which has predominantly focused on game effectiveness, by demonstrating that a comprehensive understanding of instructional impacts requires attention to the integration of various learning conditions, allowing games to function as part of a meaningful learning strategy rather than merely as learning media (Arifa et al., 2018; Sumiyati & Surjono, 2026). At the same time, the growing availability of technology supporting the development of game-based learning should be considered, as logical thinking skills have consequently become an increasingly important competency (Laksana, 2024).

This study implies that the design of game-based learning should consider the integration of various learning conditions that shape students' learning experiences. The development of game-based learning should be directed toward designing a learning system that integrates play activity design, teachers' pedagogical strategies, learning environment support, and active student

participation as a unified and complementary whole. This perspective provides a conceptual contribution to the development of game-based learning design by positioning learning conditions as a central component determining the quality of learning experiences and the development of children's logical operation skills. Thus, this study extends the understanding of game-based learning beyond an approach that merely utilizes games toward a comprehensive learning system deliberately designed to support children's cognitive development.

CONCLUSION

This study successfully developed an industry needs-based Short Video course using the ADDIE model that met the criteria of validity, reliability, and effectiveness in improving students' learning outcomes and creativity in vocational education. The findings show that the successful development of the course was supported by the use of digital technology and a development process that began with an analysis of industry needs, followed by curriculum design, learning resource development, learning implementation, and systematic evaluation, resulting in a course that was relevant and had a positive impact on students. The implementation results showed that the integration of industry projects, authentic learning resources, and an assessment system aligned with workplace needs was able to create a more contextual learning experience and improve students' competencies. This study extends the implementation of the ADDIE model from learning media development to an industry needs-based course development framework that integrates all learning components into a complete development process. From the perspective of Educational Technology, this study emphasizes the importance of integrating user needs, instructional design, and continuous evaluation in producing quality learning. In addition, the findings provide a practical contribution to vocational education by providing a course development model that can be replicated to support curriculum alignment with technological developments and industry needs. Therefore, future research is recommended to implement this development model in various vocational fields and evaluate its long-term impact on graduate competencies and work readiness in industrial settings.

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