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Technology-Based Collaborative Learning Design at Politeknik Media Kreatif: Integrating Computer Science and Islamic Values

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ABSTRACT

This study develops a technology-based collaborative learning design implemented at Politeknik Media Kreatif, focusing on the integration of computer science and Islamic values. The primary goal of this design is to create an interactive, innovative, and relevant learning ecosystem aligned with the demands of the digital era while embedding ethical and moral values rooted in Islamic principles. The research adopts a research and development (R&D) approach using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The resulting design includes a collaborative digital platform facilitating project-based learning and group discussions. Each learning module integrates technology concepts such as programming, multimedia design, and data management with Islamic ethical teachings such as honesty, cooperation, and responsibility. Trials of the design demonstrated significant improvements in students' technical skills as well as their understanding and application of Islamic values in the learning process. This design contributes to developing holistic learning that empowers students intellectually and spiritually while preparing them for the dynamic challenges of the professional world.

Keywords: Collaborative Learning, Technology, Islamic Values, Politeknik Media Kreatif, Computer Science.

1. INTRODUCTION

The rapid advancement of technology in the 21st century has transformed the educational landscape, demanding innovative teaching methods to equip students with the skills required for the digital era. In this context, collaborative learning, supported by technology, emerges as a powerful approach to foster critical thinking, problem-solving, and teamwork. Collaborative learning leverages technology to create interactive and engaging learning environments that transcend traditional classroom boundaries.

At Politeknik Media Kreatif, where students are trained in creative industries such as multimedia, design, and information technology, integrating collaborative learning with technological tools is particularly relevant. However, education at the polytechnic level must not only address technical competencies but also instill ethical

and moral values. In a predominantly Muslim country like Indonesia, embedding Islamic values—such as honesty, responsibility, and cooperation—into the curriculum is essential for holistic student development.

Despite the increasing implementation of technology-enhanced learning, existing studies reveal several gaps. Research by the OECD (2019) indicates that while collaborative learning approaches improve students' problem-solving skills by 19% on average, many implementations lack a robust ethical framework. Similarly, a report from Indonesia's Ministry of Education (Kemendikbud, 2021) highlights that only 42% of vocational and polytechnic curricula effectively integrate moral and cultural values, suggesting a significant disconnect between technical education and character building.

Furthermore, prior studies have focused extensively on the technical aspects of collaborative learning (e.g., software platforms and group dynamics) but have paid less attention to the integration of religious or ethical values. Research conducted by Judijanto, & Yulianti on Islamic education in vocational contexts emphasizes the need for structured frameworks that harmonize Islamic teachings with professional competencies, an area that remains underexplored (Judijanto, & Yulianti, 2024).

Another gap lies in the regional implementation of collaborative learning in Indonesia. Data from UNESCO (2022) show that less than 35% of educational institutions in Southeast Asia incorporate technology-driven collaborative learning, with a disproportionate focus on urban areas. This underscores the necessity of scalable, culturally sensitive models that can be adapted to polytechnic institutions like Politeknik Media Kreatif.

Addressing these gaps, this study proposes a design that integrates collaborative learning with Islamic values through a systematic approach. By embedding moral and ethical principles within a technology-driven learning framework, this research seeks to develop a holistic educational model. The results are expected to enhance students' technical skills and foster ethical awareness, preparing them for the challenges of the modern workforce.

This research begins by outlining the theoretical foundations of collaborative learning and the significance of Islamic values in education. It then details the methodology used to develop the design, presents the findings, and discusses their implications for the broader educational landscape.

2. METHODS

This study employed a Research and Development (R&D) approach to design, develop, and evaluate a technology-based collaborative learning model integrated with Islamic values. This method was chosen to produce an applicable and relevant

educational framework for the needs of Politeknik Media Kreatif (Mesra, 2023). The development process followed the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), consisting of five main stages (Syafitri, L. (2021).

a. Analysis Stage

This stage involved identifying learning needs and analyzing the context at Politeknik Media Kreatif. Key activities included:

1) Student needs analysis: A survey of 120 students across various programs was conducted to understand their technical skills, learning needs, and perceptions of collaborative learning.
2) Curriculum analysis: The existing curriculum was reviewed to assess the extent to which Islamic values were integrated into technology-based courses.
3) Literature review: Previous studies on collaborative learning, educational technology, and Islamic values in education were examined to identify gaps and opportunities for development.

b. Design Stage

This stage produced the initial design of the learning model. Key activities included:

1) Learning objectives formulation: Objectives were defined to combine mastery of technical skills with the application of Islamic values.
2) Module structure development: A project-based learning module was created, integrating technological topics such as programming and multimedia design with values like honesty, responsibility, and teamwork.
3) Digital platform design: A prototype for a collaborative digital platform was designed to support group discussions, resource sharing, and evaluation.

c. Development Stage

During this stage, the learning modules and digital platform were developed and tested. Activities included:

1) Content creation: Digital learning materials, including video tutorials, interactive presentations, and case studies based on Islamic values, were developed.
2) Platform development: A web-based learning platform was built to enable online group work and collaboration.
3) Expert validation: The modules and platform were evaluated by experts in education, technology, and Islamic studies to ensure feasibility and relevance.

d. Implementation Stage

The developed design was implemented in two pilot classes involving 60 students. Activities included:

1) Student orientation: Students were introduced to the platform and learning modules.
2) Learning execution: Students completed group projects guided by instructors, utilizing the digital platform and applying Islamic values in their processes.
3) Data collection: Observations, interviews, and surveys were conducted to evaluate the effectiveness of the learning process.

e. Evaluation Stage

This stage involved formative and summative evaluations of the learning design. Activities included:

1) Formative evaluation: Feedback from students and instructors was gathered during the learning process to refine the modules and platform.
2) Summative evaluation: The effectiveness of the model was assessed based on students' learning outcomes, technical skill improvements, and understanding of Islamic values. Data analysis was conducted quantitatively and qualitatively.

f. Research Instruments

The instruments used in this study included:

1) Questionnaires: To measure students' understanding of the material and Islamic values.
2) Observations: To assess student engagement during the collaborative learning process.
3) In-depth interviews: To gather perspectives from instructors and students on the learning design.

g. Data Analysis

Data were analyzed using a mixed-methods approach:

1) Quantitative analysis assessed improvements in learning outcomes based on pre-test and post-test scores.
2) Qualitative analysis explored students' and instructors' experiences with the learning model implementation.

This method ensured that the resulting learning design was not only technically effective but also ethically relevant and culturally appropriate for Politeknik Media Kreatif.

3. FINDINGS AND DISCUSSION

The findings of this study focus on the effectiveness and impact of integrating technology-based collaborative learning with Islamic values at Politeknik Media Kreatif. The results are discussed in relation to previous research and expert opinions to substantiate the outcomes of this study. The analysis is categorized into three key themes: (1) technical skill development, (2) integration of Islamic values, and (3) the role of collaborative learning platforms.

a. Technical Skill Development

One of the primary objectives of this study was to enhance students' technical competencies, particularly in areas such as programming, multimedia design, and data management. Results from the pre-test and post-test assessments showed a significant improvement in students' technical skills after participating in the collaborative learning modules. On average, students' scores increased by 23%, indicating that the integration of project-based learning and collaborative tasks effectively supported the mastery of technical subjects.

These findings align with the research conducted by Afriadi, which found that collaborative learning approaches significantly boost students' problem-solving and critical thinking skills, particularly in technical subjects (Afriadi, 2024). Moreover, the use of digital platforms to facilitate collaboration was consistent with findings from Dacholfany, et all., who highlighted that the incorporation of technology in collaborative learning environments enhanced both the depth of learning and engagement among students (Dacholfany, et all., 2023). This study corroborates these results by showing that students at Politeknik Media Kreatif were able to improve their technical abilities through hands-on learning and peer collaboration, facilitated by the digital platform.

b. Integration of Islamic Values

An equally important goal of this study was to incorporate Islamic values such as honesty, responsibility, cooperation, and ethical conduct into the learning process. The results from surveys and interviews with students indicated that the students were able to connect the concepts of Islamic ethics with their technical learning. Approximately 78% of the students reported that the integration of Islamic values during the learning process positively influenced their approach to teamwork, project management, and ethical decision-making in their technical work.

This outcome supports the findings of Hamid, & Sudira, who emphasized the need for vocational education programs to integrate Islamic values with technical competencies in order to produce well-rounded professionals (Hamid, & Sudira, 2013). The positive impact of this integration is further supported by Ehwanudin, Irhamudin, & Wijaya, who argued that embedding moral and ethical frameworks,

such as those derived from Islamic teachings, into vocational curricula helps cultivate not only professional skills but also a strong ethical foundation (Ehwanudin, Irhamudin, & Wijaya, 2022). In this study, the application of Islamic values was shown to foster a sense of responsibility, honesty, and teamwork among students, leading to more ethical and cooperative group dynamics during project work.

Furthermore, the values of Islamic ethics were reinforced through guided discussions, reflection sessions, and project activities where students were encouraged to relate their actions and decisions to Islamic teachings. This approach is in line with the suggestions of Juariah, who proposed that ethical values should be incorporated into educational practices to guide students in making morally sound decisions in their professional lives (Juariah, 2023).

c. The Role of Collaborative Learning Platforms

The use of a collaborative learning platform played a crucial role in facilitating the integration of technology and teamwork. Observations and feedback from students indicated that the platform provided a user-friendly interface for sharing resources, discussing ideas, and managing group tasks. The platform's interactive features—such as discussion forums, real-time collaboration tools, and task management boards—allowed students to engage actively with one another, enhancing their learning experience.

This finding aligns with previous research by Garrison and Anderson (2011), who found that online learning platforms enhance student engagement and foster deeper learning by promoting active interaction (Khan, et all., 2017). The platform also supported the development of a community of practice, as students were able to collaborate on projects, share their expertise, and learn from each other. Research by Lee and Choi (2014) similarly highlighted the positive impact of technology-enhanced collaborative learning on student engagement and academic achievement (한정윤, 2019). In this study, the use of technology was essential for creating an environment where students could collaborate effectively, share knowledge, and engage with the course content in a meaningful way.

d. Challenges and Areas for Improvement

Despite the positive outcomes, several challenges were identified during the implementation phase. One of the primary challenges was the varying levels of digital literacy among students, which occasionally hindered smooth navigation of the collaborative platform. While most students adapted quickly, some struggled with the technical aspects, which affected their ability to collaborate efficiently in the early stages of the course. This challenge is consistent with the

findings of several studies, including those by Turnip, which indicated that digital literacy is a critical factor in the success of technology-driven learning initiatives (Turnip, 2023).

To address this, additional support and training in using digital tools were incorporated into the curriculum for future iterations of the course. The study also found that some students were initially hesitant to embrace the collaborative learning model, as they were more accustomed to traditional, teacher-centered learning methods. This observation resonates with the findings of Beers, who noted that students in traditional educational systems may need time and encouragement to fully engage in collaborative learning environments (Panitz & Panitz, 1998).

e. Implications for Future Research and Practice

This study contributes to the growing body of literature on the integration of technology, collaborative learning, and values-based education. Future research could further explore the long-term impact of such learning models on students' professional and ethical development. Additionally, further studies could investigate the scalability of this model in other polytechnic institutions across different regions, particularly in areas with diverse cultural and religious backgrounds.

Moreover, the findings of this study highlight the importance of fostering digital literacy and providing continuous support to students in technology-driven learning environments. Ensuring that all students are equipped with the necessary skills to navigate collaborative platforms is crucial for maximizing the effectiveness of such educational models.

4. CONCLUSION

This study explored the integration of technology-based collaborative learning with Islamic values at Politeknik Media Kreatif. The findings highlight the significant positive impact of this model on students' technical skills, ethical awareness, and collaborative abilities. The key conclusions drawn from the research are as follows:

a. Enhancement of Technical Competencies: The integration of project-based learning, supported by technology, effectively improved students' technical skills in areas such as programming, multimedia design, and data management. Collaborative tasks allowed students to apply theoretical knowledge in practical settings, leading to a deeper understanding and mastery of the subject matter.

b. Positive Integration of Islamic Values: The incorporation of Islamic values such as honesty, responsibility, teamwork, and ethical behavior was successful in shaping students' professional and personal development. Students reported that the values guided their decision-making and teamwork throughout the collaborative projects, reinforcing the importance of ethical conduct in technical work.
c. Effective Use of Collaborative Platforms: The digital platform used for collaborative learning significantly enhanced student engagement, communication, and teamwork. The platform enabled students to share resources, discuss ideas, and manage projects collaboratively, thus enriching the learning process. This aligns with previous research on the role of technology in fostering active learning and peer collaboration.
d. Challenges and Areas for Improvement: While the model demonstrated positive outcomes, challenges such as varying levels of digital literacy and initial resistance to collaborative learning methods were noted. Future implementations should include targeted digital literacy training and further support for students unfamiliar with collaborative learning environments to ensure equal participation and effective collaboration.

In conclusion, the integration of technology-based collaborative learning with Islamic values presents a promising approach to education at Politeknik Media Kreatif. This model not only enhances students' technical skills but also fosters the development of ethical values that are crucial in the professional world. Future research and practice should focus on refining the model, addressing challenges, and exploring its scalability to other institutions, ensuring a more inclusive and holistic learning experience for students.

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