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Effectiveness of Guided Inquiry-Blended Learning Model with Interactive Media Based on Religious Moderation to Enhance Students' 4C Skills

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ABSTRACT
This study investigates the effectiveness of a Guided Inquiry Blended Learning model supported by interactive media and grounded in the principles of religious moderation in enhancing students' 4C skills (critical thinking, creativity, collaboration, and communication). The research employed a One-Group Pretest–Posttest design involving undergraduate students of the Information Systems Study Program, Faculty of Information Technology, Universitas KH. A. Wahab Hasbullah (UNWAHA). Data were collected through achievement tests, classroom observations, and student response questionnaires. The data were analyzed using descriptive statistics, including percentages, mean scores, and normalized gain (N-gain), as well as inferential analysis using a paired-sample t-test. The results show that the implementation of the Guided Inquiry Blended Learning model reached a very high level across all instructional phases, with implementation rates ranging from 93.75% to 100%. Students' 4C skills improved significantly after the intervention, as indicated by a high average N-gain score of 0.73. The paired-sample t-test revealed a statistically significant difference between pretest and posttest scores, confirming the effectiveness of the learning model. Furthermore, the integration of interactive media and religious moderation values created an inclusive and dialogical learning environment. Students became more actively engaged in inquiry-based problem solving, collaborative group work, and constructive academic communication. Overall, the findings indicate that the Guided Inquiry Blended Learning model is effective in strengthening Information Systems students' 4C skills and supports student-centered learning aligned with the demands of 21st-century higher education.

Keywords: *4C Skills; Guided Inquiry; Blended Learning; Interactive Media; Religious Moderation.*

INTRODUCTION
The era of global society 5.0 requires individuals to balance economic progress with the resolution of social problems through the utilization of technological innovations emerging from the Fourth Industrial Revolution. Rapid digital transformation, particularly through the internet, compels the education sector to respond to these changes by preparing graduates who are adaptive and competent. Higher education institutions, including Information Technology programs, are expected to produce students capable of critical and creative thinking, equipped with strong digital literacy to face increasingly complex global challenges. Consequently, university curricula must be oriented toward strengthening students' hard skills and soft skills so they can adapt to diverse professional contexts. Critical thinking, innovation, interpersonal abilities, and preparedness for the demands of the digital era have become essential competencies that must be prioritized. Mukhlasin (2019) emphasizes that curricular orientation should shift toward reinforcing 21st-century competencies and focusing on fields of Science, Technology, Engineering, and Mathematics (STEM), which are relevant to global needs and encourage student-centered learning.

Changes in the characteristics of digital-generation learners also demand innovations in instructional strategies. Jukes et al. (as cited in Tham, 2011) state that today's students are accustomed to multitasking, graphic visualization, and internet-based interaction, making traditional teaching models increasingly less appealing to them. This condition compels lecturers to design learning experiences that are more interactive, flexible, and aligned with students' digital ecosystems. Blended learning is considered one of the

approaches most relevant to accommodating these needs.

Students' 4C skills, particularly in Islamic Education (PAI) courses, still require significant improvement. Previous studies indicate that instructional media used by lecturers have not fully supported the development of critical thinking (Wahyuaji & Suparman, 2018). Meanwhile, the guided inquiry model has been proven effective in enhancing conceptual discovery skills, critical thinking, and students' learning motivation (Supriadi, 2019; Ingkawang et al., 2018; Nuriali et al., 2018). Through this method, students do not merely memorize religious concepts from textbooks or lectures; instead, they are given opportunities to train and develop information-processing abilities, reasoning skills, and more comprehensive knowledge mastery (Maryam et al., 2020). These findings are in line with Muhdana et al. (2020), who demonstrate that guided inquiry instruction significantly improves students' critical thinking abilities after its implementation. Samadun and Diwkoranto (2022) further affirm that scientific inquiry skills must be supported by strong curiosity, collaborative capacities, and critical thinking competence. Individuals who possess critical thinking skills tend to demonstrate systematic reasoning in evaluating ideas, strong motivation to identify and solve problems, and constructive skepticism.

Blended learning practices are also proven effective in improving the quality of learning processes. Jennifer Rogers of the University of Iowa concludes that blended learning is more effective than either face-to-face or fully online instruction (Setiawan, 2021). This trend has also been adopted by universities in Asia, such as China, Japan, Korea, and Singapore, which integrate diverse digital technologies to create learning experiences that are more flexible, expansive, and meaningful (Tham & Tham, 2011). Blended learning is considered innovative because it fosters active, personalized, engaging learning and enhances students' academic outcomes (Sahni, 2019). In fact, this combined approach has great potential to develop students' reflective and argumentative thinking in understanding religious moderation more deeply, aligned with the demands of 21st-century learning. This research gap highlights the need for interactive and innovative instructional models that emphasize not only cognitive aspects but also meaningful and mindful learning that shapes contextual religious attitudes while ensuring enjoyable learning experiences aligned with students' needs.

Considering the aforementioned findings, it is essential to develop an instructional model that integrates the strengths of guided inquiry with the flexibility of blended learning and the effectiveness of the flipped classroom strategy. The Guided Inquiry-Based Blended Learning model assisted is considered highly promising for improving students' 4C skills, particularly among Information Technology students enrolled in Islamic Education courses. The integration of these models is expected to create more meaningful learning experiences, facilitate deeper exploration of concepts, and better prepare students to meet the competency demands of the digital era.

METHOD

This study employs a quasi-experimental research design using a pre-test–post-test nonequivalent control group structure. This design was selected to compare the effectiveness of the Guided Inquiry–Blended Learning model against a control group that received conventional instruction in the Islamic Education (PAI) course. The research population consisted of all first-semester Information Technology students enrolled in the PAI course. The sampling technique applied was simple random sampling to assign participants randomly into the experimental and control groups.

The study involved two primary variables: independent and dependent variables. The independent variable was the implementation of the Guided Inquiry–Blended Learning model in the experimental group, while the control group received direct instruction commonly used by the lecturer. The dependent variables included students' 4C skills and their conceptual understanding of PAI related materials. Data were collected through critical thinking tests and concept comprehension tests administered before and after the intervention. Pre-test and post-test scores were then used to calculate the normalized gain score to determine the level of improvement in each variable.

Data were collected through 4C skills tests (pretest and posttest), observations of learning activities, and documentation of students' learning outcomes. Quantitative data analysis involved prerequisite testing (normality and homogeneity), gain score calculation, comparative analysis using independent samples t-tests or Mann–Whitney tests as appropriate, and effect size estimation to determine the effectiveness of the implemented learning model, while ensuring instrument validity and adherence to research ethics.

RESULT AND DISCUSSION

Based on the research results and field findings, it was identified that students enrolled in the Islamic Religious Education (Pendidikan Agama Islam/PAI) course encountered several challenges in the learning process. Students tended to be passive during lectures on religious moderation. Of the 39 students observed, only approximately five to six students actively asked questions or responded to the material presented by the lecturer. This condition indicates a low level of student engagement in learning activities that were still predominantly characterized by conventional lecture-based instruction.

Prior to the implementation of the model, students' readiness before learning was at an average score of 3.0. Following the implementation of the model, the score increased to 4.0. This improvement suggests that students were better prepared to participate in lectures, as they had independently accessed learning materials and instructional videos before face-to-face sessions. Similarly, the indicators of active questioning and responding increased from an average score of 2.5 before implementation to 4.0 afterward. This increase demonstrates that students became more actively involved in discussions, both in posing critical questions and responding to the views of lecturers and peers. Regarding participation in group discussions, the average score increased from 2.8 to 4.2. This finding indicates that the collaborative approach integrated into the learning model effectively encouraged students to engage more actively in group activities and to reflectively and openly discuss religious issues.

Improvements were also observed in collaboration and teamwork skills, with average scores rising from 2.9 before implementation to 4.0 afterward. Students demonstrated enhanced abilities to work collaboratively, respect differing perspectives, and build group consensus based on the principles of religious moderation. Meanwhile, for the indicator of task completion during class, the average score increased from 3.0 to 4.3. This result indicates that students became more productive and responsible in completing assignments, particularly because they had already understood the learning materials in advance and were therefore able to contribute more actively during classroom activities.

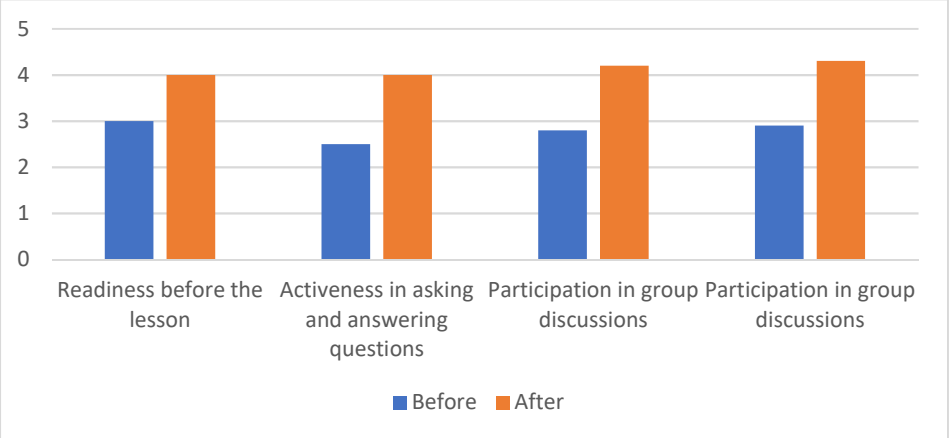


Figure 1. Comparison of Learning Activities Before and After the Implementation of the Guided Inquiry Learning Model

Overall, the graph illustrates that the implementation of the Guided Inquiry Learning model based not only enhanced students' readiness and learning activeness, but also strengthened their collaborative and reflective abilities in understanding the values of religious moderation through interactive and participatory learning processes. Prior to the implementation of the model, students' readiness to participate in lectures was relatively low. Most students attended classes without having read or reviewed the learning materials beforehand, resulting in classroom instruction that primarily involved one-way information transfer from the lecturer to the students. Consequently, instructional time was not optimally utilized for activities that foster critical, dialogical, and collaborative thinking, key aspects in internalizing the values of religious moderation.

After the implementation of the Guided Inquiry Learning model based, a significant change occurred in students' learning activities and participation. Before face-to-face meetings, 82% of students, or approximately 32 out of 39, had accessed instructional materials in the form of videos, digital modules, and reflective content provided by the lecturer. Students came to class with better prior understanding, enabling them to actively participate in inquiry-based activities, such as analyzing cases of intolerance through group discussions and reflecting on moderate Islamic values embedded in those cases.

The increase in questioning and expressing opinions became one of the most important indicators of

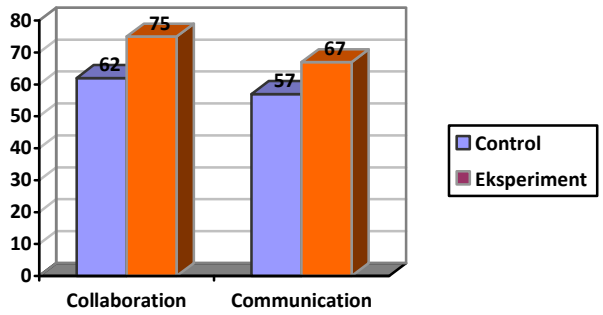
this transformation. After the model was implemented, an average of 17 to 18 students actively asked questions in each session, while the number of students providing responses to questions posed by the lecturer or peers increased to 20–22 students. This heightened level of participation indicates that students felt more confident in expressing their religious perspectives and were more open to differing viewpoints within a constructive academic environment.

Collaborative activities also increased significantly. Students who had studied the materials beforehand were better prepared to engage in group discussions. They were able to connect PAI concepts related to religious tolerance with attitudes of tasamuh (tolerance) as presented in the instructional videos. Based on classroom observations, lecturers noted that student groups were more capable of constructing arguments during case analyses and were able to produce solutions aligned with the principles of religious moderation.

In addition to changes in learning behavior, students also demonstrated improvements in motivation and self-confidence. Most students reported greater enthusiasm for participating in lectures because they had already understood the fundamental concepts through digital media. They felt more prepared to engage in dialogue, participate in inquiry-based activities, and no longer hesitated to express their opinions in front of their peers. Learning became more engaging, as students were no longer passive recipients of lecturers' explanations, but active participants in exploration, problem-solving, and group presentation activities.

Based on data analysis, the most substantial improvement was observed in the aspects of active questioning and participation in discussions. The average number of actively involved students increased nearly threefold compared to the period before the model's implementation. This finding indicates that the Guided Inquiry- Blended Learning model was able to comprehensively transform students' learning behavior from passive to active, from information recipients to knowledge constructors, and from individual learners to collaborative participants. Overall, the implementation of this model had a positive impact on strengthening students' values of religious moderation. Through inquiry and collaborative activities, students not only understood the theological concepts of moderation but also learned to apply them within social and academic contexts. This learning process fostered critical, open-minded, and respectful attitudes toward diversity, which are fundamental pillars in developing an Islamic character that embodies the principle of *rahmatan lil 'alamin*.

The Guided Inquiry- Blended Learning Model enables students to develop problem-solving skills, logical thinking, and the ability to design experiments collaboratively. These skills are evident when students work together in groups, formulate hypotheses, ask questions to the instructor, and express their ideas or articulate what they have learned throughout the inquiry process (Ashoumi & Hidayatulloh, 2024). The Guided Inquiry-Bended Learning Model emphasizes active student engagement through structured inquiry stages that encourage interaction, discussion, and shared responsibility for knowledge construction. Differences in students' skill development before and after the intervention, both in the experimental and control classes, are illustrated in Figures 1, 2, and 3.

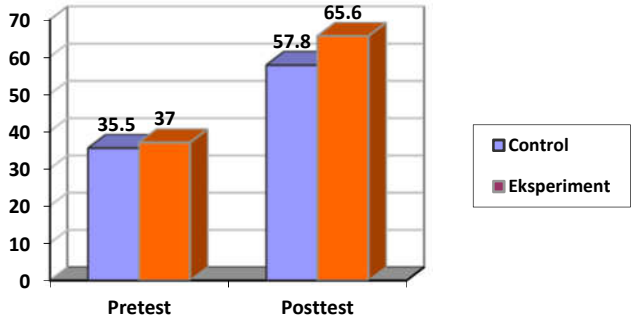


Figures 2. Communication and Collaboration

The pretest of students' collaboration skills was conducted solely through observational assessment during the learning process. The subject lecturer observed students' behavior during classroom activities. At this stage, no meaningful discussion or collaborative interaction among students was identified, either in the control group or the experimental group. This condition occurred because the learning process was still dominated by conventional teaching methods, in which the lecturer primarily delivered content through lectures without incorporating discussion-based or collaborative learning strategies. As a result, students'

initial collaboration skills in both groups could not be adequately assessed. In higher education, particularly in courses aiming to develop students' 4C skills, learning should progressively shift from conventional, lecturer-centered instruction toward more innovative, student-centered approaches. The Guided Inquiry Learning Model supported by interactive media and grounded in the values of religious moderation offers such an alternative by encouraging active engagement, dialogue, and cooperation among students.

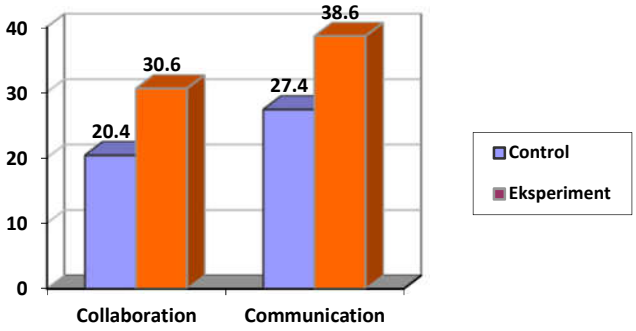
As illustrated in Figure 2, the average posttest score of students' collaboration skills in the experimental group was higher than that of the control group. This improvement can be attributed to the Guided Inquiry Learning Model, which provides opportunities for students to collaboratively construct knowledge, share perspectives, and develop mutual understanding through inquiry-based activities. Collaborative inquiry fosters a learning environment that promotes active participation, effective communication, and collective problem solving (Fullan & Scott, 2014; Setiani, 2023). Collaborative group work aims to establish positive interdependence among group members, where students rely on one another to achieve shared learning goals. In this model, learning tasks are distributed among group members, yet responsibility for outcomes remains collective (Imami et al., 2024). Through the integration of interactive media and religious moderation values, students are also guided to engage respectfully, appreciate differences, and communicate constructively, key components of collaboration and communication within the broader framework of 4C skills development.



Figures 3. Critical Thingking

The average score of students' critical thinking skills in the experimental group before the implementation of the Guided Inquiry Blended Learning Model supported by interactive media and grounded in religious moderation values was 35.5, while the control group obtained an average score of 37.0. As illustrated in Figure 3, there was a noticeable improvement in students' critical thinking skills after the intervention. The posttest average score increased to 57.8 in the experimental group and 65.6 in the control group. The improvement in critical thinking skills among students in the experimental group indicates that the application of the Guided Inquiry Blended Learning Model effectively promotes higher-order thinking. This model emphasizes experiential learning principles aligned with constructivist learning theory, where students actively construct knowledge through inquiry, reflection, and interaction (Hidayatulloh et al., 2024)

Guided inquiry-blended learning represents an innovative instructional approach that supports the development of 4C skills, particularly critical thinking, creativity, collaboration, and communication. Through structured inquiry activities, students are encouraged to engage in deep information processing, balance conceptual understanding with practical application, and collaboratively identify and generate optimal solutions to complex problems. In this model, students work in small groups and are guided toward discovering theoretical foundations through collaborative inquiry processes (Badrumilah & Rigianti, 2022). Moreover, the integration of interactive media and religious moderation values fosters an inclusive, ethical, and dialogical learning environment. This approach not only enhances students' understanding of complex academic concepts but also strengthens their ability to respect diverse perspectives, communicate constructively, and collaborate effectively, core competencies required in 21st-century higher education .



Figures 4. Creative Thinking

The average score of students' creative thinking skills in the experimental group before the intervention was 39, while the control group achieved an average score of 36. After both groups received different instructional treatments namely, the experimental group was taught using the Guided Inquiry Blended Learning Model supported by interactive media and grounded in religious moderation values, whereas the control group was taught using conventional discussion-based instruction the average score of creative thinking skills in the experimental group increased to 66, while the control group reached 58, as illustrated in Figure 4. The improvement in students' creative thinking skills in the experimental group can be attributed to the characteristics of the Guided Inquiry-Blended Learning Model, which actively engages students in sharing knowledge, understanding scientific theories and empirical evidence, formulating problem-solving strategies, and developing both critical and creative thinking abilities (Sahni, 2019). Through inquiry-based activities integrated with interactive digital media, students are encouraged to explore ideas independently and collaboratively prior to and during classroom sessions.

Students in the experimental group demonstrated higher levels of active participation, as each group collaboratively worked to refine inquiry questions, collect and analyze evidence, determine problem-solving steps, and share findings and recommendations. This guided inquiry process fosters reflective and ethical actions aimed at improving learning practices through careful examination of evidence, particularly when discussing contextual issues embedded with values of religious moderation. The lecturer plays an active role as a facilitator, guiding students in analyzing problems and identifying appropriate or alternative solutions. In contrast, individual and passive learning approaches have been found to be less effective for problem-solving tasks compared to interactive learning activities such as responding to questions, explaining ideas to peers, and engaging in collaborative discussions that promote shared understanding and collective knowledge construction (Means et al., 2013).

CONCLUSION

The findings of this study demonstrate that the Guided Inquiry Blended Learning Model supported by interactive media and grounded in the values of religious moderation is effective in enhancing university students' 4C skills (critical thinking, creativity, collaboration, and communication). The implementation of the model successfully transformed the learning process from a lecturer-centered approach to a student-centered, inquiry-oriented environment. Students showed marked improvements in readiness, active participation, questioning behavior, group discussion involvement, and task completion. The integration of pre-class independent learning with in-class guided inquiry enabled students to come to class with stronger prior knowledge, allowing instructional time to be used more effectively for higher-order thinking, dialogue, and collaborative problem-solving. These outcomes indicate that the model not only improves cognitive performance but also fosters active engagement and reflective learning behaviors.

Moreover, the incorporation of interactive media and religious moderation principles contributed to the development of an inclusive, ethical, and dialogical learning atmosphere. Students became more confident in expressing ideas, more open to differing perspectives, and more capable of building collective understanding through collaboration. Through inquiry-based activities, case analysis, and group reflection, students were able to internalize values of tolerance, respect, and moderation while simultaneously developing essential 21st-century competencies. Overall, the Guided Inquiry Blended Learning Model offers a pedagogically sound and contextually relevant approach for higher education, particularly in courses aiming to strengthen both academic skills and character formation. Its application has significant implications for fostering holistic student development aligned with the demands of contemporary higher

education and the cultivation of moderate, critical, and collaborative graduates.

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