

Developing an ICT-Integrated Differentiated Learning Model to Address the Diverse Learning Styles of Islamic Religious Education Students

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Abstract

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The diversity of learning styles among students of Islamic Religious Education (PAI) at Nurul Jadid University has not been fully accommodated through uniform instructional approaches, thus necessitating the development of a more adaptive instructional model integrated with digital technology. This study aims to develop an ICT-based differentiated learning model capable of systematically and contextually addressing the diversity of students' learning styles. This research employs a qualitative case study design. Data were collected through in-depth interviews, participatory observation, and document analysis. The findings reveal that the use of ICT in the learning process remains general and has not been consistently implemented in line with differentiation principles, resulting in suboptimal learning experiences. Thematic analysis identifies four major needs: the diversity of students' learning styles, the need to adjust instructional strategies, students' instructional needs, and the demand for more flexible learning. Based on these findings, an ICT-based differentiated learning model is formulated, consisting of learning style identification, differentiation design, multi-path learning implementation, and adaptive evaluation. The findings further indicate that the proposed model can serve as a strategic alternative to enhance the quality of learning in higher education. Its implementation can encourage lecturers to adopt more adaptive teaching practices and improve student engagement, motivation, and learning effectiveness, particularly in Islamic Religious Education programs.

Kata kunci:

Pembelajaran Berdiferensiasi, Teknologi Informasi dan Komunikasi (TIK), Gaya Belajar Mahasiswa, Model Pembelajaran Adaptif, Pendidikan Agama Islam (PAI).

Abstrak

Keberagaman gaya belajar di kalangan mahasiswa Pendidikan Agama Islam (PAI) di Universitas Nurul Jadid belum sepenuhnya terakomodasi melalui pendekatan pembelajaran yang seragam, sehingga diperlukan pengembangan model pembelajaran yang lebih adaptif dan terintegrasi dengan teknologi digital. Penelitian ini bertujuan untuk mengembangkan model pembelajaran berdiferensiasi berbasis TIK yang mampu mengakomodasi keragaman gaya belajar mahasiswa secara sistematis dan kontekstual. Penelitian ini menggunakan desain studi kasus kualitatif. Data dikumpulkan melalui wawancara mendalam, observasi partisipatif, dan analisis dokumen. Hasil penelitian menunjukkan bahwa penggunaan TIK dalam proses pembelajaran masih bersifat umum dan belum diterapkan secara konsisten sesuai dengan prinsip diferensiasi, sehingga menghasilkan pengalaman belajar yang belum optimal. Analisis tematik mengidentifikasi empat kebutuhan utama, yaitu: keragaman gaya belajar mahasiswa, kebutuhan penyesuaian strategi

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pembelajaran, kebutuhan belajar mahasiswa, serta tuntutan akan pembelajaran yang lebih fleksibel. Berdasarkan temuan tersebut, dirumuskan model pembelajaran berdiferensiasi berbasis TIK yang terdiri atas identifikasi gaya belajar, perancangan diferensiasi, implementasi pembelajaran multi-jalur, dan evaluasi adaptif. Temuan ini juga menunjukkan bahwa model yang diusulkan dapat menjadi alternatif strategis untuk meningkatkan kualitas pembelajaran di perguruan tinggi. Implementasinya dapat mendorong dosen untuk menerapkan praktik pengajaran yang lebih adaptif serta meningkatkan keterlibatan, motivasi, dan efektivitas belajar mahasiswa, khususnya dalam program Pendidikan Agama Islam..

INTRODUCTION.

Students exhibit diverse learning styles, including visual, auditory, kinesthetic, and combinations of these modalities (Hasani and Xhomara 2022; Fallace 2023). These differences influence how students absorb, process, and express information during the learning process. Therefore, uniform instructional models are insufficient to accommodate students' diverse needs (Wahab et al. 2024; Jaya et al. 2024; Maulana, n.d.). This situation contributes to low levels of active participation and learning motivation among students in the classroom (Nasution et al. 2025; Wahyu et al. 2025; Fajri et al. 2025). Such a gap indicates the need for a more responsive instructional approach that addresses individual learning needs. In this context, the concept of differentiated learning emerges as a relevant solution. This model emphasizes the adaptation of teaching strategies based on students' needs, interests, and learning styles.

The implementation of information technology in learning at Nurul Jadid University has become an integral part of the academic system. Islamic Religious Education (PAI) students are accustomed to accessing learning materials through digital platforms, participating in online classes, and utilizing web-based learning applications (Barikzai et al. 2025; Posangi et al. 2025). Although the use of ICT has expanded access to information, gaps remain in how students absorb and respond to digital content. Some students learn more effectively through instructional videos, while others require interactive activities or hands-on practice. Uniform instructional approaches are not always effective, as they fail to take into account individual learning styles. Consequently, students whose learning preferences are not aligned with certain instructional models tend to experience a decline in interest and learning motivation (Susanti et al. 2023).

A major challenge in the learning process among Islamic Religious Education (PAI) students lies in the gap between the instructional models employed and students' learning needs (Aris 2024; Azmi 2025). Students with unique learning styles often feel inadequately accommodated and encounter difficulties in achieving their full academic potential. Uniform instructional methods also make it difficult for lecturers to comprehensively evaluate learning outcomes (Gymnastiar 2024; Salsabila et al. 2024). The lack of adaptive instructional models further reduces the effectiveness of teaching, particularly in the context of knowledge development and learning outcomes. Differentiated learning emerges as a strategic approach to address these issues in a contextual manner. This model enables lecturers to adjust the content, process, and product of learning in accordance with students' diverse learning styles.

Previous studies have shown that differentiated learning can enhance students' motivation and learning outcomes. Nurafiati and Angriawan (2025) revealed that the transformation of a technology-based differentiated learning model in Physical Education courses at a university in Makassar had a significantly positive impact. Their findings indicate that grouping students based on their learning styles and adapting instructional materials increased learning motivation by up to 80% and improved learning outcomes by approximately 15%. These findings emphasize that the integration of technology in differentiated learning is not merely about the use of digital media; rather, it requires alignment with individual learner characteristics to maximize participation and outcomes, thereby ensuring that the overall learning objectives are effectively achieved.

A study by Taqwim et al. (2025) states that the effectiveness of differentiated learning largely depends on collaboration among teachers, supportive educational policies, and the appropriate use of technology. This finding demonstrates that technology functions not only as a medium for delivering information but also as a means of strengthening differentiated instructional strategies. However, the literature also indicates that uniform ICT-based approaches without differentiation continue to pose challenges for students with certain learning styles. Therefore, it is necessary to design a learning model that is not only digitally based but also flexible in accommodating students' characteristics. In this regard, ICT-based differentiated learning emerges as a strategic solution to enhance the effectiveness of higher education, including in Islamic Religious Education (PAI) programs.

Reffiane et al. (2024) reported that differentiated learning implemented through the Merdeka Belajar Curriculum significantly improved students' science and technology literacy skills. This model utilizes student grouping based on learning styles and personalizes practicum activities as well as science and technology reflections, resulting in "very good" categories for material modification (85%) and technology utilization (92%). These findings confirm that ICT-based differentiation can enhance student participation and conceptual understanding more evenly. This approach also positions lecturers as facilitators rather than mere transmitters of knowledge, thereby providing students with broader learning opportunities. Differentiated strategies supported by technology enable students to select forms of material access and final tasks that align with their individual learning styles.

Preliminary findings of this study indicate that students in the Islamic Religious Education (PAI) program at Nurul Jadid University exhibit diverse learning style preferences, including visual, auditory, and kinesthetic modalities. However, most lecturers still employ uniform instructional approaches. These findings reveal a gap between students' learning needs and the instructional strategies implemented in the classroom. This condition highlights the importance of developing a learning model that is not only adaptive to students' learning styles but also optimally integrates technology to support the differentiation of content, process, and learning products. By designing a contextual model aligned with the characteristics of the institution and PAI students, the learning process is expected to become more effective, interactive, and meaningful (Fauzi et al. 2025; Munir and Solihah 2026).

Differentiated learning models provide flexibility for lecturers to design instructional activities based on students' individual needs (Hidayati et al. 2025; Rahmadani 2025). This approach is particularly relevant in addressing the challenges of diverse learning styles in modern higher education. Nurul Jadid University, as one of the Islamic higher education

institutions, has not yet fully implemented differentiated learning practices. This gap represents a significant area to be addressed in this study. This research not only produces a theoretical model but also offers a practical and implementable framework that can be applied by lecturers in similar contexts. Therefore, this study demonstrates novelty and provides a meaningful contribution in addressing the challenges of contemporary and future higher education.

Through this study, the development of a differentiated learning model is specifically directed at students of the Islamic Religious Education (PAI) program. Accordingly, the model is designed to be more contextual and applicable. This research is not merely theoretical in nature but also focuses on the practical implementation of the model in classroom settings. The model testing process involves both lecturers and students directly to evaluate the effectiveness of this approach. Furthermore, the findings of this study may serve as a reference for other higher education institutions seeking to adopt similar approaches. The development of this model is also aligned with the Merdeka Curriculum, which emphasizes differentiation and personalized learning. It is expected that the results of this study will provide meaningful contributions to innovative PAI learning practices that are relevant to the demands of the 21st century.

RESEARCH METHOD

This study employs a qualitative approach using a case study design, as it aims to explore in depth the process of developing a differentiated learning model within a specific context, namely the Islamic Religious Education (PAI) program at Nurul Jadid University. A case study was selected to obtain a comprehensive understanding of how students' learning styles can be accommodated within differentiated learning practices. The focus of this study is on actual classroom practices as well as the dynamics of interaction among lecturers, students, and the learning environment. The researcher not only observes but also actively participates in the process of developing and testing the learning model. This approach enables the collection of rich, contextual, and in-depth data that cannot be achieved through quantitative methods alone.

The subjects of this study consist of course lecturers and Islamic Religious Education (PAI) students who participate in classes using a blended learning approach. The participants were selected using purposive sampling, in which individuals were intentionally chosen based on specific criteria relevant to the research objectives. The criteria for participants include: (1) active sixth-semester students who have completed at least two courses based on project-based or discussion-based learning; and (2) lecturers who have implemented differentiated learning approaches. This technique was employed to enable the researcher to obtain data from individuals who possess a clear understanding of the context and the phenomena under investigation. Through this approach, participants are not selected to represent the population statistically, but rather to provide rich and relevant information.

Data were collected through two primary techniques, namely in-depth interviews and participatory observation. The interviews were conducted in a semi-structured manner to obtain information regarding the perceptions, experiences, and challenges faced by both lecturers and students in the differentiated learning process. Participatory observation was

employed to directly examine classroom learning activities, including interactions, the media utilized, and forms of differentiation that naturally emerged. Data validity was ensured through triangulation of sources, techniques, and time, as well as through peer debriefing and member checking. All procedures were carried out systematically to ensure that the data obtained were accurate, credible, and contextually appropriate. Through this approach, the findings are expected to provide an authentic and in-depth understanding of the development of an ICT-based differentiated learning model within the PAI context.

RESULT AND DISCUSSION

Result

Based on the interview findings, the informants stated that the need for an ICT-based differentiated learning model is highly urgent in the lecture process. This urgency arises from the diversity of students' learning styles, ranging from visual, auditory, and kinesthetic to mixed styles, making uniform instructional approaches no longer adequate. This finding is consistent with the statement of Fathor Rozi, one of the informants, who emphasized that the pesantren-based university environment at Nurul Jadid University, which has implemented ICT-based learning, provides significant opportunities to develop more adaptive and contextual learning through the utilization of digital media. However, its implementation still requires strengthening lecturers' pedagogical competencies to align with the principles of differentiation. The mapping of students' learning styles based on interview results indicates variations in learning preferences, which are further visualized in graphical form to support and strengthen the analysis of the research findings, as presented below:

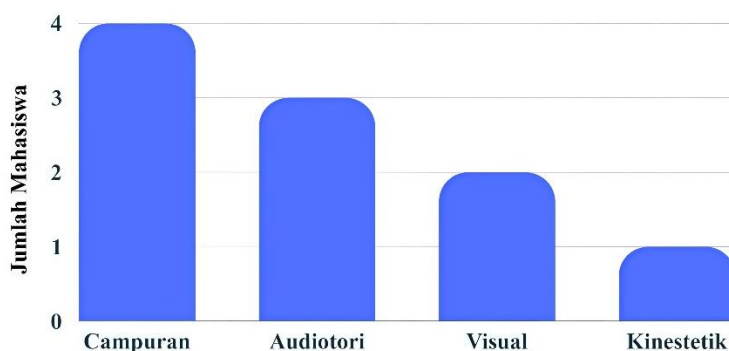


Figure 1. Variation of Learning Preferences

The graph illustrates a tendency toward the dominance of auditory and mixed learning styles among students across three classes, followed by visual and kinesthetic styles. This variation confirms that students' learning processes are inherently heterogeneous and cannot be adequately addressed through a single, uniform instructional approach. From the perspective of differentiated learning theory, these findings reinforce the importance of adapting learning objectives, content, processes, and products based on students' characteristics. The visualization does not represent the number of respondents in a quantitative sense; rather, it depicts the intensity of the emergence of learning style themes within the interview data. Therefore, this diagram serves as an analytical foundation that

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strengthens the urgency of implementing ICT-based differentiated learning as a pedagogical strategy to more effectively and sustainably accommodate the diversity of students' learning styles.

The findings from the interviews were subsequently analyzed through coding and categorization processes to identify patterns in students' learning experiences and lecturers' instructional strategies. From this thematic analysis, four major themes emerged, namely: variations in learning styles, forms of lecturers' instructional responses, students' instructional needs, and expectations regarding the implementation of differentiated learning. A summary of these themes is presented in the following table of interview results:

Table 1. Summary of Interview Findings

Respondent	Question	Key Focus	Response
Lecturer 1	Urgency of differentiation	Adaptation to learning needs	Differentiation is essential to accommodate diverse learning styles and to avoid monotonous instructional models.
Lecturer 2	Challenges	Planning and needs identification	Lecturers need to analyze students' characteristics and design instruction aligned with differentiation principles.
Lecturer 3	Expectations	ICT-based PAI learning model	PAI learning is expected to be more interactive, flexible, and to optimally utilize technology.
Student 1	Learning experience	Uniform instructional model	Some lecturers still apply uniform models, which are unable to accommodate students' diverse learning styles.
Student 2	Learning needs	Media variation and practice	Students require a variety of digital media and practical activities to better understand the material.
Student 3	Learning environment	Learning conditions and engagement	Students need a quiet learning environment and active involvement from lecturers during the learning process.
Student 4	Role of ICT	Effectiveness of audiovisual media	Audiovisual media are very helpful, but their implementation is not yet evenly distributed across all classes.
Student 5	Expectations	Consistency of ICT use	Lecturers are expected to consistently use digital media and adapt instructional models to diverse learning styles.

This phenomenon is also reflected in the dynamics of classroom learning interactions. The information provided by the informants indicates a gap between the potential of ICT as a medium for adaptive learning and the instructional strategies employed by lecturers, which still tend to rely on general approaches. From the perspective of differentiated learning theory, the effectiveness of instruction depends not only on the variety of media used but also on lecturers' ability to align learning objectives, content, processes, and products with students' characteristics. In the context of Nurul Jadid University, ICT should play a role as a catalyst for the differentiation process by providing multiple learning materials, flexible access, and a variety of activities that accommodate students' learning

preferences. Therefore, enhancing lecturers' capacity to design differentiation-based instruction, along with ensuring its consistent implementation in the classroom, becomes a prerequisite for achieving optimal adaptive learning.

Observations of Islamic Religious Education (PAI) learning practices across several classes indicate that the use of ICT has become an integral part of daily instructional activities, including the use of LCD projectors, digital slides, electronic modules, and online platforms. Some lecturers have also begun to implement differentiation in simple forms, such as providing choices of activities, employing various modes of content delivery, or offering opportunities for exploration through digital media. However, such implementation remains uneven. In several learning sessions, lecture-based and discussion-based methods still dominate, thereby limiting opportunities for students with kinesthetic or mixed learning preferences to fully engage. Students with visual preferences appear to benefit more from the use of slides, whereas those who require movement, hands-on practice, or collaborative activities have not yet been equally accommodated in the learning process.

The findings from the interviews were subsequently analyzed through coding and categorization processes to identify patterns in students' learning experiences and lecturers' instructional strategies. From this thematic analysis, four major themes emerged, namely: variations in learning styles, forms of lecturers' instructional responses, students' instructional needs, and expectations regarding the implementation of differentiated learning. A summary of these themes is presented in the following table of interview results:

Overall, the integration of interviews, classroom observations, and documentation indicates that the potential for implementing ICT-based differentiated learning at Nurul Jadid University is indeed substantial, yet it has not been fully optimized. Differentiation in terms of content and product appears relatively easier for lecturers to implement, as it can be adjusted through variations in media and assignments. In contrast, differentiation in the learning process requires greater readiness, both in terms of planning, pedagogical creativity, and the availability of learning facilities. These findings emphasize that the success of differentiation depends not only on the availability of ICT, but also on lecturers' ability to manage flexible and responsive instructional approaches. With strengthened pedagogical competencies and more targeted use of digital media, PAI learning at Nurul Jadid University has the potential to evolve into a more adaptive system capable of sustainably accommodating the diversity of students' learning styles.

DISCUSSION

Design of an ICT-Based Differentiated Learning Model in Islamic Religious Education

The design of an ICT-based differentiated learning model in Islamic Religious Education (PAI) is developed in response to the diversity of student characteristics and learning styles at Nurul Jadid University. This model is expected to address the gap between students' learning characteristics and the learning outcome demands in higher education (Ulkhaira 2025; Abdurrahim 2022). The research findings indicate that students exhibit diverse learning preferences, including visual, auditory, kinesthetic, and combinations of these styles. This condition suggests that uniform instructional approaches are not sufficient to optimally accommodate students' learning needs. Therefore, a learning model design that

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is flexible, adaptive, and contextual is required to ensure that the PAI learning process can be conducted more effectively and inclusively.

Conceptually, this learning model is grounded in the principles of differentiated instruction, which emphasize the adaptation of learning to students' needs, interests, and readiness through the differentiation of content, process, and product. Content differentiation is designed by providing learning materials in various formats, such as text, visuals, audio, and interactive media, enabling students to access materials according to their preferred learning styles. Process differentiation is implemented through the provision of alternative learning pathways, including discussion, hands-on practice, and digital exploration, allowing students to actively engage in diverse learning experiences (Rokhimawan et al. 2025). Meanwhile, product differentiation offers students the opportunity to demonstrate their learning outcomes in various forms, such as digital presentations, instructional videos, infographics, and project-based outputs (Diarera and Budiarti 2024; Reffiane et al. 2024). Through the application of these principles, PAI learning is expected to accommodate individual differences more proportionally and equitably.

The integration of ICT within the design of the differentiated learning model functions both as a reinforcing element and as a connector among instructional components. The use of digital technology enables lecturers to present learning materials in more varied formats, provide flexible spaces for interaction, and facilitate continuous monitoring of students' learning progress. Through the use of online learning platforms, interactive digital media, and educational applications, ICT plays a crucial role in expanding access to learning while simultaneously enhancing the quality of interaction between lecturers and students (Aduba and Mayowa-Adebara 2022; Alenezi et al. 2023). In the context of PAI learning, the use of ICT is also directed toward supporting the internalization of Islamic values through contextual and meaningful learning approaches. Thus, technology functions not merely as a supporting tool, but as an integral part of a deliberately designed and strategically implemented pedagogical approach.

Overall, the design of the ICT-based differentiated learning model in PAI serves as a pedagogical framework that enables lecturers to systematically, flexibly, and responsively design instruction in accordance with the diversity of students' learning styles. This model not only emphasizes the variation of instructional strategies and learning media, but also directs the use of digital technology as a structured means of personalizing learning. Therefore, this model design provides a conceptual foundation for the development and implementation of more effective differentiated learning within the context of Islamic higher education (Agazu et al. 2025; Hariyati and Rofiq 2024; Fauziyah et al. 2025). The existence of this design further strengthens the position of PAI learning as an academic process that is adaptive to technological advancements and responsive to students' needs.

Development of an ICT-Based Differentiated Learning Model

The development of an ICT-based differentiated learning model at Nurul Jadid University represents a strategic effort to address the challenges of learning within a pesantren-based higher education environment. The research findings indicate that students in the Islamic Religious Education (PAI) program exhibit heterogeneous characteristics in terms of academic background, levels of learning readiness, and variations in learning

styles. This condition necessitates the implementation of a flexible learning model that enables students to access learning experiences through approaches aligned with their individual needs and characteristics (Rozi and Nisa' 2023; Müller et al. 2023). In this context, differentiated learning combined with the use of digital technology provides opportunities for lecturers to design diverse learning pathways without neglecting the established learning outcome standards (Makda 2025; Alam and Mohanty 2023). Therefore, the developed model does not merely focus on increasing the variety of learning media, but is designed as a pedagogical framework that optimizes the role of ICT in delivering adaptive, interactive, measurable, and relevant learning experiences.

In its development process, this model is structured around three core components, namely content differentiation, process differentiation, and product differentiation (Atikah et al. 2024; Bender-Salazar 2023). These components are integrated with the use of ICT as a connecting element across learning pathways to ensure that the implementation remains structured and systematic. Content differentiation is realized through the provision of learning materials in various formats, such as text, audio, visuals, and interactive media, allowing students the flexibility to select learning resources that align with their preferences and learning styles. Process differentiation is designed by offering alternative learning pathways, including discussion, hands-on practice, digital exploration, and observation, enabling students to gain diverse learning experiences. Meanwhile, product differentiation provides opportunities for students to determine how they demonstrate their learning outcomes, such as through videos, infographics, digital presentations, written summaries, or action-based projects (Harina et al. 2025; Fadila et al. 2025). The integration of ICT across these three components ensures that differentiated learning can be implemented flexibly without compromising the coherence of the learning process or the consistency of learning outcomes. To illustrate the interconnection among the stages within the ICT-based differentiated learning model, a cycle diagram is presented in Cycle 1.

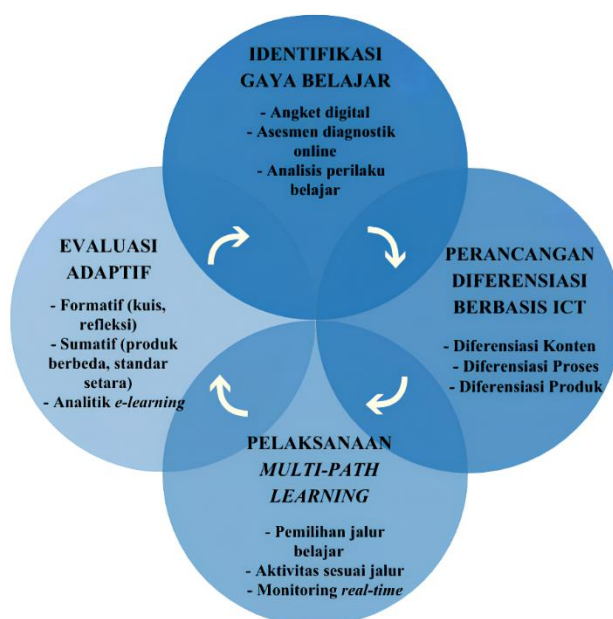


Figure 2. Cycle of Differentiated Learning Process

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Based on Figure 2, the initial stage of the learning model begins with the identification of students' learning styles. In this phase, lecturers map students' learning tendencies through the use of digital questionnaires, analysis of learning activity patterns, and diagnostic assessments conducted via online platforms (Djayadin and Mubarakah 2021; Soro and Prapitasari 2024). The results of this mapping serve as a crucial foundation for designing more personalized learning pathways that align with individual student needs. Information regarding students' learning styles – whether visual, auditory, kinesthetic, or a combination of these preferences – is subsequently used as a reference in designing balanced variations of content, process, and learning products in accordance with students' abilities and learning tendencies. Thus, the identification of learning styles functions not only as a grouping mechanism but also as a foundation for designing learning experiences that are aligned with students' learning profiles.

The second stage focuses on the design of ICT-based differentiated instruction. At this stage, lecturers develop learning materials in various digital formats that can be selected by students according to their learning style preferences (Nguyen et al. 2022; Jugembayeva and Murzagaliyeva 2022). Students with visual preferences are provided with materials such as infographics, digital concept maps, or instructional videos. For auditory learners, learning resources are offered in the form of audio recordings, voice-based discussions, or short podcasts, while kinesthetic learners are directed toward hands-on activities, digital simulations, or tasks involving direct interaction. Students with mixed learning styles are given access to a combination of these formats. In addition to content, differentiation in the learning process is also designed through alternative learning pathways, including discussion-based, practice-based, digital exploration, and observation pathways. Each pathway is supported by ICT tools such as Google Classroom, Zoom breakout rooms, Padlet, and simulation applications to ensure that the learning experience is closely aligned with students' characteristics.

The third stage represents the implementation phase of multi-path learning. At this stage, students are given the opportunity to select learning pathways that best align with their preferences and then engage in a series of learning activities based on the options that have been previously designed. Lecturers act as facilitators who monitor students' progress in real time through various digital features, such as comment sections in e-learning platforms, learning analytics, and formative assessments conducted through online systems (Suleiman et al. 2025; Wang et al. 2025). This monitoring enables more personalized, responsive, and interactive engagement between lecturers and students. It is at this stage that learning dynamics become more varied, as each student undergoes different learning experiences while still being guided toward achieving the same learning outcomes.

The final stage of this model is adaptive evaluation. In this phase, the assessment process is not solely focused on final outcomes but also takes into account the learning process and the learning pathways selected by students throughout the course. Formative evaluation is conducted through digital quizzes, structured reflection activities, and timely feedback, enabling lecturers to continuously monitor students' learning progress. Meanwhile, summative evaluation is aligned with the type of final product chosen by the students. Although the formats for demonstrating learning outcomes vary, the level of complexity, competency indicators, and learning outcome standards remain equivalent

(Zhang et al. 2023; Brownlie et al. 2024). This adaptive evaluation approach ensures that differentiation does not lower academic standards; instead, it provides opportunities for students to achieve competencies optimally through their preferred learning styles.

The four stages of the ICT-based differentiated learning model collectively form a comprehensive framework that can be sustainably implemented within the context of pesantren-based higher education. The integration of learning style identification, differentiation design, multi-path learning implementation, and adaptive evaluation enables lecturers to provide more equitable, flexible, and responsive learning experiences that accommodate the diversity of students' characteristics (Listiani 2022; Imami et al. 2025). This model not only introduces variations in instructional strategies but also directs the use of digital technology toward a more systematic form of personalized learning within the Islamic Religious Education (PAI) program at Nurul Jadid University. Therefore, this model holds significant potential to serve as a reference for the development of ICT-based learning innovations in other Islamic higher education institutions.

Learning Styles through ICT-Based Differentiated Instruction

The ICT-based differentiated instruction approach provides a broader framework for accommodating the diverse learning styles of students in the Islamic Education (PAI) program at Universitas Nurul Jadid. Research findings indicate that students exhibit a range of learning preferences, including visual, auditory, kinesthetic, and mixed learning styles. Such diversity necessitates instructional strategies that are not uniform but are instead capable of adapting content delivery, learning processes, and assessment methods to align with individual learning characteristics. Through the implementation of ICT-based differentiated instruction, variations in learning styles are no longer viewed as obstacles but rather as pedagogical assets that can be leveraged to optimize the PAI learning process. This approach aligns with the student-centered learning paradigm, which emphasizes the importance of responsiveness to individual learning needs and promotes inclusive, adaptive, and meaningful educational experiences.

Students with a visual learning preference demonstrate better comprehension when instruction is supported by digital media such as infographics, educational videos, and interactive concept maps. Meanwhile, students with an auditory learning style benefit more from oral discussions, audio-based explanations, and recorded lessons that can be accessed flexibly. Kinesthetic learners exhibit higher engagement when learning is supplemented with practical activities, digital simulations, and hands-on, experience-based projects. For students with mixed learning styles, the integration of various digital media formats facilitates a more balanced and comprehensive learning experience (El-Sabagh 2021; Rasheed and Wahid 2021). This variation in instructional strategies illustrates the crucial role of ICT in bridging differences in students' learning preferences and optimizing the overall learning process.

The differentiated learning approach based on ICT also fosters flexibility within the learning process (Darlian et al. 2025; Sitorus 2025). Students are provided with the opportunity to select learning paths and types of activities that align with their individual learning preferences without compromising the required learning outcomes. Through the utilization of online learning platforms, instructors can offer a variety of alternative activities and learning resources while continuously monitoring students' progress (Aduba and

Mayowa-Adebara 2022; Kumar et al. 2021). This flexibility contributes to increased student engagement and promotes the development of more independent and responsible learning behaviors. These findings indicate that learning flexibility can be effectively implemented in parallel with the achievement of established academic standards (Amalia 2025).

From a pedagogical perspective, the implementation of an ICT-based differentiated learning approach requires instructors to be well-prepared in understanding students' learning style characteristics and in designing adaptive and responsive instruction (Aleksieva 2025; Endahati and Triastuti 2024). In this context, the role of the instructor extends beyond merely delivering content; they act as facilitators capable of managing diverse learning styles through creative, structured, and student-centered instructional design. With the support of ICT, instructors have greater opportunities to develop PAI learning that is personalized, interactive, and contextually relevant, without neglecting the internalization of Islamic values. Therefore, enhancing instructors' pedagogical competence becomes a key factor in the successful implementation of this model.

Exploring Learning Styles through a Differentiated Instruction Approach

Exploring learning styles through a differentiated instruction approach serves as a relevant pedagogical strategy to address the diversity of student characteristics in higher education (Almujab 2023; Ilda and Rahayu 2025). Students exhibit a variety of learning preferences, including visual, auditory, kinesthetic, and mixed styles, which influence how they receive, process, and comprehend instructional information. Uniform instructional delivery has the potential to overlook these differences, thereby preventing some students from achieving optimal learning outcomes. In this context, the differentiated instruction approach is regarded as an effort to create a more equitable and inclusive learning environment. By exploring students' learning styles, instructors gain an initial understanding of learners' needs, which serves as a foundation for designing adaptive and responsive instructional strategies.

The differentiated instruction approach in exploring learning styles emphasizes the importance of flexibility in the learning process (Rombe et al. 2023; Dewi et al. 2025). Differentiation extends beyond content to include both the learning process and the final product. Content differentiation allows students to access instructional materials in various formats, such as written text, visuals, audio, and interactive media. Students with a visual preference tend to comprehend concepts more effectively through graphic representations, while auditory learners benefit more from verbal explanations or discussions (Azizah and Mardiana 2024). Meanwhile, kinesthetic learners require hands-on engagement through practical activities to make learning more meaningful. Process differentiation provides students with the opportunity to follow learning pathways aligned with their individual preferences.

Exploring learning styles through a differentiated approach also plays a significant role in enhancing students' motivation and learning autonomy. Providing students with the opportunity to learn according to their preferred learning styles fosters a sense of being valued and increases ownership over the learning process (Risma and Hanif 2024; Usman and Rohmah 2024). This condition positively impacts intrinsic motivation, as students are no longer entirely bound to a single instructional method that may not align with their

individual characteristics. Furthermore, differentiated instruction encourages students to recognize their strengths and limitations within their learning styles. This awareness serves as a crucial foundation for developing more effective learning strategies, both in formal educational settings and in independent learning contexts.

In the context of higher education, particularly within pesantren-based institutions, exploring learning styles through a differentiated approach presents both challenges and opportunities. Students come from diverse educational backgrounds, with varying learning experiences and levels of academic readiness (Samsudi et al. 2024; Sahayu et al. 2026). Traditional one-way instructional methods often fail to optimally accommodate this diversity. Therefore, a differentiated approach serves as a relevant alternative to bridge the differences in student characteristics. Through the exploration of learning styles, instructors can design learning experiences that remain grounded in academic and religious values, yet are delivered through more varied instructional methods. The utilization of digital technology further supports this process, for example, through online learning platforms that allow the presentation of materials in multiple formats and learning pathways.

Overall, exploring learning styles through a differentiated approach represents a strategic step toward enhancing the quality of higher education (Cipta 2025; Sanjaya et al. 2025). This approach views student diversity as a pedagogical potential to be managed rather than as an obstacle in the learning process. Understanding students' learning styles enables instructors to design learning experiences that are more adaptive, effective, and meaningful. Furthermore, the exploration of learning styles reinforces the principle of equity in education, as each student is provided with opportunities to learn and demonstrate competence in ways that align with their individual characteristics. A differentiated approach also promotes a more humanistic, student-centered learning environment. In the long term, implementing this approach is expected to produce graduates who are not only academically competent but also possess self-awareness and the ability to manage their own learning independently.

CONCLUSION

This study concludes that the diversity of learning styles among PAI students at Universitas Nurul Jadid including visual, auditory, kinesthetic, and mixed styles has not been fully accommodated in current instructional practices. Although some lecturers have utilized ICT, its application remains general and has not been consistently integrated with the principles of differentiation. Based on the analysis of interview, observation, and documentation data, this study developed an ICT-based differentiated learning model comprising four main stages: identification of learning styles, differentiation design, multi-path learning implementation, and adaptive evaluation. The model contributes significantly by providing a practical framework that is more responsive to students' learning needs while optimizing the use of technology to create a more flexible, interactive, and student-centered learning process. These findings can serve as a strategic reference for developing innovative learning practices in pesantren-based higher education settings.

This study also has several limitations. The qualitative approach employed, along with the limited scope of subjects confined to a single study program, suggests that the generalizability of the findings should be interpreted with caution. Documentation of instructional practices revealed variations in implementation among lecturers, indicating

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that the developed model has not yet been tested broadly across different course contexts. Furthermore, the effectiveness of the model has not been quantitatively evaluated, so its direct impact on student learning outcomes cannot be statistically confirmed. Future research is recommended to pilot the model in more diverse contexts, involving a larger number of courses and lecturers, and to apply a mixed-methods design to obtain a more comprehensive assessment of its effectiveness. Additionally, the development of operational guidelines and the provision of lecturer training are suggested to ensure that the model can be implemented systematically and sustainably.

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