



Beyond Cooperative Learning: Jigsaw as an Integrated Learning Management Strategy for Enhancing Learning Quality

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ABSTRACT

Keywords:

Jigsaw Method;
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This study aimed to analyze the implementation of the Jigsaw method as a learning management strategy and examine its contribution to improving learning quality among students in the Islamic Education Management Study Program at high School. A descriptive qualitative approach was employed, involving one lecturer and 18 students. Data were collected through participant observation, in-depth interviews, and documentation during three learning meetings and analyzed using data condensation, data display, and conclusion drawing. The findings revealed progressive improvements in learning quality across student activity, learning motivation, material understanding, and learning outcomes. Evaluation performance increased from 50.0% of students demonstrating responses in the first meeting to 77.8% in the second and 94.4% in the third. The study concludes that systematically managed Jigsaw learning strengthens participation, responsibility, collaboration, confidence, and material mastery. The implication is that Jigsaw can function beyond a cooperative technique as an integrated learning management strategy for promoting active, student-centered, and quality-oriented learning in Islamic higher education.

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INTRODUCTION

Higher education institutions have a strategic responsibility to prepare graduates who possess not only theoretical knowledge but also critical thinking, collaboration, communication, and adaptability to global change (Alotaibi, 2024). These competencies are increasingly important because graduates are expected to respond effectively to complex social, technological, and professional challenges (Javed & Alenezi, 2023; Veseli et al., 2025). Therefore, improving the quality of higher education requires more than strengthening lecturer and student competencies; it also requires systematic management of the learning process and its supporting components (McNamara et al., 2025; Naseer et al., 2025). Rokhmah and Subhi (2025) demonstrated that learning quality assurance can operate effectively when supported by structured planning, implementation, evaluation, and commitment from educational stakeholders (Lorente et al., 2024).

This evidence indicates that effective learning management is essential for creating meaningful learning experiences and producing graduates who are competent, adaptive, collaborative, and capable of contributing positively to society.

Despite increasing expectations for graduate quality, learning practices in higher education continue to face challenges related to conventional teaching methods, limited instructional variation, and insufficient student participation (Agonafir, 2023; Maldonado López et al., 2023). Lecturer-centered instruction, particularly one-way lecturing, can position students primarily as recipients of information and reduce opportunities to develop critical thinking, communication, collaboration, and individual responsibility. Zulaikah et al. (2024) identified limited variation in learning methods as one factor that may hinder optimal learning achievement (Daniel et al., 2024; Solak et al., 2025). Conversely, cooperative learning approaches have demonstrated potential to increase student participation and learning activity. These conditions reflect a broader educational problem because students require learning experiences that actively involve them in constructing knowledge and developing transferable competencies (Chugh et al., 2023; Mardiyah et al., 2024). Therefore, higher education institutions need learning strategies that simultaneously promote student engagement, collaborative learning, responsibility, and effective management of the learning process in accordance with contemporary educational demands.

This problem is also evident in the Islamic Education Management Study Program. Preliminary observations and interviews with the lecturer indicated that classroom learning was still dominated by lectures and relatively simple discussion activities. Consequently, several students tended to remain passive, demonstrated limited confidence in expressing opinions, and had not developed strong responsibility for group learning tasks (Benson et al., 2024; Kilpeläinen-Pettersson et al., 2025). Student participation had not yet developed optimally because classroom interactions did not consistently provide meaningful opportunities for every student to contribute (Gallagher-Ford et al., 2025; Stokstad et al., 2026). This condition is particularly significant for Islamic Education Management students because their future professional roles require not only cognitive competence but also managerial, communication, leadership, and teamwork skills. If the existing learning pattern continues, the learning process may not fully develop these competencies. Therefore, an appropriate learning management strategy is needed to systematically organize student participation, interaction, collaboration, and responsibility within the learning process.

Previous studies have demonstrated the potential of the Jigsaw method to improve various dimensions of learning quality. Developed by Elliot Aronson and his colleagues in 1971, Jigsaw organizes students into home groups and expert groups, requiring each student to master a specific portion of learning material and subsequently teach it to members of the home group (C.-M. Chen & Huang, 2024; Darabi et al., 2024). This mechanism promotes individual

responsibility, positive interdependence, interaction, and peer learning. Nopiyanto and Raibowo (2020) found that Jigsaw could improve students' motivation and learning outcomes, while Erviana et al. (2024) reported improvements in cooperation and active participation (L. Chen, 2025; Lee et al., 2023). Similarly, Maryati et al. (2024) demonstrated that Jigsaw contributed to student activity and learning outcomes. These findings establish strong empirical support for Jigsaw as a cooperative learning strategy. However, previous studies have generally examined Jigsaw in relation to specific outcomes rather than positioning it within comprehensive learning management in higher education.

The main limitation of previous research concerns the limited integration of Jigsaw into a comprehensive learning management framework involving planning, organizing, implementing, and evaluating. Most studies have positioned Jigsaw primarily as a cooperative instructional technique and examined its effects on motivation, participation, cooperation, or learning outcomes separately (Y. Chen et al., 2025; Khodadadeh et al., 2025). Less attention has been given to how the method is systematically planned, organized, implemented, monitored, and evaluated as an integrated learning management process (Jeppu et al., 2023; Zhan et al., 2024). This gap is important because learning quality depends not only on the characteristics of an instructional method but also on how effectively the method is managed. Furthermore, learning process standards within the Internal Quality Assurance System of higher education emphasize systematic planning, implementation, evaluation, and continuous development, as reflected in Regulation of the Minister of Education, Culture, Research, and Technology Number 53 of 2023 (Hasibuan et al., 2024). Therefore, research integrating Jigsaw with comprehensive learning management remains necessary to strengthen the quality and sustainability of higher education learning (Izmi et al., 2025; Lin et al., 2024).

The state of the art of this study lies in positioning the Jigsaw method not merely as a cooperative learning model but as a strategic instrument within learning management. This perspective integrates four managerial functions planning, organizing, implementing, and evaluating with four dimensions of learning quality: student activity, learning motivation, material understanding, and learning outcomes. Through this framework, Jigsaw can be examined from the preparation of learning objectives and materials, organization of home and expert groups, distribution of student roles, implementation of collaborative interaction, and evaluation of learning achievement. This approach extends previous findings concerning the effectiveness of Jigsaw by emphasizing the managerial processes underlying its implementation. Thus, this study offers a more integrated perspective for developing participatory, collaborative, student-centered, and quality-oriented learning management in Islamic higher education.

Based on the foregoing discussion, the central research problem concerns how learning management through the implementation of the Jigsaw method can improve the quality of learning among students in the Islamic Education Management Study Program at STIT Al Hikmah Benda Brebes. This study argues that Jigsaw can produce more optimal learning outcomes when implemented

through systematic management rather than treated merely as an instructional technique. Effective planning is expected to establish learning objectives, materials, group structures, and learning procedures; organizing is expected to distribute roles and responsibilities; implementation is expected to strengthen participation, collaboration, and interaction; and evaluation is expected to identify learning achievement and areas requiring improvement. Accordingly, this study aims to analyze learning management through Jigsaw implementation and its contribution to improving student activity, learning motivation, material understanding, and learning outcomes. The study is expected to provide theoretical and practical contributions to the development of quality-oriented learning management in Islamic higher education.

RESEARCH METHODS

This study employed a qualitative approach with a descriptive qualitative research design. This design was selected because the study aimed to explore and describe comprehensively how learning management through the implementation of the Jigsaw method was conducted in its natural educational context. Qualitative research emphasizes the exploration of phenomena based on participants' experiences, perspectives, and meanings rather than statistical generalization. Similarly, Assyakurrohim et al. (2023) explained that qualitative research enables researchers to investigate phenomena deeply through direct engagement with the research setting (Khasanah & Novita, 2025). The design was considered appropriate because the study focused on understanding four interconnected functions of learning management, namely planning, organizing, implementing, and evaluating learning. The researcher served as the main instrument (human instrument), directly collecting, interpreting, and analyzing data without manipulating variables or altering the natural learning process.

The research was conducted in the Islamic Education Management (MPI) Study Program at STIT Al Hikmah Benda Brebes, located at Jl. Bulakwungu Benda, Sirampog District, Brebes Regency, Central Java 52272. The research took place during the even semester of the 2025/2026 academic year, specifically on May 4, 11, and 18, 2026. The research participants consisted of one lecturer teaching Sociology of Education and 18 active MPI students who participated in learning activities using the Jigsaw method. Three students were selected as interview informants through purposive sampling based on their ability to provide relevant and in-depth information concerning the research focus, while considering differences in participation and academic ability. The research location was selected because the study program was directly relevant to the research focus and preliminary observations indicated that learning management required improvement, particularly in student participation, collaboration, responsibility, and active engagement.

Data were collected through participant observation, in-depth interviews, and documentation. Participant observation was conducted directly during Sociology of Education learning activities to examine the management of Jigsaw-based learning, including planning, group organization, implementation,

student interaction, lecturer facilitation, and evaluation. In-depth interviews were conducted with the lecturer and selected students to obtain information regarding their experiences, perceptions, and assessments of learning management through the Jigsaw method. Interview data were collected using interview guidelines and an audio recorder. Documentation was used to complement the primary data and included the Semester Learning Plan (RPS), attendance records, and field notes. Learning evaluation was conducted at the end of each meeting through short written essay tests covering the topics studied through the Jigsaw method. The combination of observation, interviews, and documentation supported data completeness and strengthened the credibility of the findings.

Data analysis followed an interactive model consisting of data condensation, data display, and conclusion drawing and verification. Data condensation involved selecting, simplifying, focusing, and organizing relevant information obtained from observations, interviews, and documentation concerning learning management through the Jigsaw method. The condensed data were then displayed systematically in descriptive narratives and thematic categories to facilitate interpretation of the planning, organizing, implementation, and evaluation processes. The final stage involved drawing and verifying conclusions by identifying patterns, relationships, and meanings emerging from the data. Data validity was ensured through source triangulation, technique triangulation, and member checking. Source triangulation compared information obtained from the lecturer and students, while technique triangulation compared findings from observation, interviews, and documentation. Member checking was conducted by confirming the interpreted findings with relevant informants to ensure that the results accurately reflected their experiences and perspectives.

RESULTS AND DISCUSSION

Results

Instructional Management through the Implementation of the Jigsaw Method in the MPI Study Program

Learning management through the application of the Jigsaw method in this study is operationally defined as the systematic process of managing Sociology of Education learning through four interconnected managerial functions: planning, organizing, implementing, and evaluating learning. Planning refers to the lecturer's preparation of learning objectives, materials, subtopics, and learning procedures; organizing refers to the formation of home and expert groups and the distribution of student roles and responsibilities; implementation refers to the process of expert-group and home-group discussions, student interaction, lecturer facilitation, and time management; while evaluation refers to the assessment of students' understanding after each learning session. The implementation was observed during three meetings on May 4, 11, and 18, 2026, involving one lecturer and 18 students of the MPI Study Program at STIT Al Hikmah Benda Brebes. These four functions were

implemented as an integrated process rather than as separate activities.

The interview data indicate that learning planning was deliberately prepared by the lecturer to ensure that the Jigsaw process could operate according to its intended structure. The lecturer explained, "Learning materials are prepared according to the division of subtopics for each expert group so that the discussion process can run smoothly." This statement indicates that planning was not limited to preparing teaching materials but also involved anticipating the organizational structure required by the Jigsaw method. The lecturer divided the learning materials into specific subtopics and aligned them with the responsibilities of each expert group. From the researcher's interpretation, such preparation demonstrates that the effectiveness of Jigsaw was supported by systematic instructional planning. The planning process also showed progressive development across the three meetings. At the first meeting, several students were not fully prepared, whereas during the second and third meetings, almost all students had prepared the required materials and were ready to participate. Thus, planning gradually created a more consistent learning readiness among students.

The interview findings also reveal that the organizing function played an important role in establishing students' individual and collective responsibilities. The lecturer stated, "Groups are divided based on student ability and activity to ensure a more balanced learning experience." This statement demonstrates that group formation was intentionally organized rather than conducted randomly. The 18 students were divided into three heterogeneous home groups, each consisting of six students, and subsequently mapped into expert groups according to their assigned subtopics. According to the researcher's interpretation, this organizational arrangement created positive interdependence because each student became responsible for mastering particular material before returning to the home group. The organization of two complementary group structures also encouraged students to recognize that their contribution was necessary for the success of the group. Therefore, the organizing function did not merely determine group membership but established a learning structure that distributed roles, responsibilities, and opportunities for participation among students.

The implementation observations showed a progressive pattern of student engagement throughout the three meetings. During the first meeting, expert-group discussions had already begun actively, although several students remained passive and some students lacked confidence when explaining material in their home groups. During the second meeting, participation increased substantially, with almost all students contributing to expert-group discussions and taking turns explaining their assigned material in the home groups. By the third meeting, students demonstrated more consistent participation, greater confidence, and more systematic explanations. The lecturer also functioned as a facilitator by monitoring group discussions, providing guidance when difficulties occurred, clarifying misunderstood concepts, and giving motivation and appreciation. Time management similarly improved: the

first meeting exceeded the planned discussion duration, whereas the second and third meetings were completed more efficiently. These observations indicate that repeated implementation of the Jigsaw structure gradually strengthened students' familiarity with the learning procedure, interaction, responsibility, and confidence.

Table 1. Empirical Dimensions of Learning Management through the Jigsaw Method

Learning Management Function	Empirical Findings	Researcher's Interpretation
Planning	The lecturer prepared learning objectives, learning materials, and specific subtopics before each meeting and aligned them with the responsibilities of the expert groups. Student readiness increased progressively from the first to the third meeting.	Systematic preparation provided clear learning directions and gradually strengthened students' readiness, allowing them to participate more effectively in the Jigsaw learning process.
Organizing	Eighteen students were organized into three heterogeneous home groups of six students and subsequently assigned to expert groups according to specific subtopics. Students gradually understood their roles and responsibilities in both group structures.	The dual-group structure established individual accountability and positive interdependence, ensuring that each student had a specific responsibility for contributing to group learning.
Implementation	Expert-group discussions encouraged students to exchange ideas, clarify concepts, and help one another understand the assigned material. Students subsequently returned to their home groups to explain the material to their peers. Participation and confidence increased across the three meetings.	Jigsaw transformed classroom interaction from predominantly lecturer-centered learning into collaborative peer learning. Expert-group activities strengthened knowledge construction, while peer teaching developed communication, confidence, and active participation.
Lecturer Facilitation	The lecturer monitored group discussions, provided clarification, guided students experiencing difficulties, motivated participants, and managed transitions between learning activities. The need for direct intervention decreased across the meetings.	The lecturer functioned primarily as a facilitator who maintained instructional direction while gradually encouraging students to assume greater responsibility and independence in the learning process.
Evaluation	Students completed short written essay assessments at the end of each meeting. Their responses showed progressive improvement in completeness and accuracy, with most students demonstrating better understanding by the third meeting.	Continuous evaluation provided evidence of developing material comprehension and enabled the lecturer to monitor learning progress. The improvement also suggests that repeated Jigsaw activities contributed to students' mastery of the learning material.

The findings in Table 1 demonstrate that Jigsaw implementation was embedded within an integrated learning management process involving planning, organizing, implementation, facilitation, and evaluation. Planning established learning objectives, materials, and subtopics, while organizing structured students into home and expert groups, fostering individual responsibility and positive interdependence. During implementation, expert-group discussions and peer teaching progressively shifted learning from lecturer-centered instruction toward collaborative and student-centered learning. Across three meetings, students showed increased participation, confidence, idea exchange, peer explanation, and discussion management, while dependence on lecturer guidance and difficulties in time management gradually decreased. The lecturer's role consequently shifted from intensive supervision toward facilitation. Evaluation results further indicated improved completeness and accuracy in students' responses. Overall, systematically managed Jigsaw activities generated cumulative improvements in participation, collaboration, confidence, understanding, and learning outcomes, strengthening active and student-centered learning.

The Influence of Jigsaw Method Implementation on Learning Quality

The influence of Jigsaw method implementation on learning quality is operationally defined in this study as the positive changes occurring in students' learning processes and outcomes following the implementation of cooperative learning through home-group and expert-group structures. The influence was examined through four indicators of learning quality: student activity, learning motivation, material understanding, and learning outcomes. These indicators were used to determine how systematically managed Jigsaw learning transformed students' involvement from relatively passive participation into active, responsible, collaborative, and learning-oriented engagement. Thus, the influence of Jigsaw was not assessed solely through students' evaluation scores but also through observable changes in their learning behavior, participation, confidence, and understanding throughout the learning process.

Interview findings from the lecturer indicate a substantial change in student participation following the implementation of the Jigsaw method. The lecturer stated, *"Before using the Jigsaw method, only certain students were active, while others tended to remain quiet and lacked confidence. After implementing the Jigsaw method, almost all students participated because each student had a role in the group."* This statement indicates that Jigsaw created a more evenly distributed participation structure through clearly assigned responsibilities. Students could no longer rely entirely on their peers because each member was responsible for mastering and communicating particular learning content. The researcher interprets this finding as evidence that Jigsaw strengthens positive interdependence and individual accountability, whereby students recognize that their individual contribution is essential to collective group success.

This interpretation is reinforced by the students' experiences. Vienna

Azkiya stated, *"I feel more active than before because in the Jigsaw method, each student has their own task."* This statement demonstrates that task distribution within Jigsaw not only structures group activities but also develops students' awareness of their individual academic responsibilities. Having to master specific material before explaining it to the home group encouraged students to prepare themselves more seriously. The researcher interprets this condition as a transition from instruction-driven participation to responsibility-driven participation, in which students become actively involved not merely because of the lecturer's instructions but because they recognize the necessity of fulfilling their academic role within the group.

Observation across the three meetings revealed a consistent improvement in the four indicators of learning quality. During the first meeting, several students still required lecturer guidance, some were hesitant to explain the assigned material, and group time management was not yet optimal. During the second meeting, students demonstrated greater confidence in expressing opinions, explaining material to peers, and managing group discussions. By the third meeting, almost all students actively participated in discussions, asked questions, explained learning materials, and completed evaluations more independently. These observations indicate that the effectiveness of Jigsaw developed progressively through repeated implementation rather than occurring immediately. The researcher interprets this progression as evidence that repeated exposure to the Jigsaw structure enabled students to understand group procedures, internalize individual responsibility, and gradually develop greater autonomy in managing their own learning.

In restatement, the research data show that Jigsaw influenced learning quality through interconnected changes in students' learning processes and outcomes. When students were assigned responsibility for particular learning materials, they were encouraged to study more seriously; when they had to explain the materials to peers, their understanding became deeper; when discussions became more active, their motivation and confidence increased; and when their understanding improved, they became better prepared to complete learning evaluations. Therefore, changes in student activity, motivation, material understanding, and learning outcomes should not be viewed as isolated findings but as interconnected components of a learning process in which improvement in one dimension reinforced development in the others.

The dominant pattern emerging from the data is progressive improvement, reflected in the gradual enhancement of learning quality from the first to the third meeting. The pattern demonstrates a logical relationship between the structure of Jigsaw and changes in students' learning behavior: assigned responsibilities increased participation, increased participation strengthened motivation, discussion and peer teaching deepened material understanding, and stronger understanding contributed to improved learning outcomes. Thus, the influence of Jigsaw on learning quality was cumulative and multidimensional, affecting not only students' cognitive achievement but also their behavioral and affective engagement. The findings therefore suggest that

Jigsaw functions not merely as a cooperative learning technique but as a systematic learning management strategy that develops student participation, responsibility, collaboration, confidence, and learning independence.

Table 2. Development of Evaluation Results Student in Implementation Jigsaw Method

Meeting	Amount Student	Able to Answer Evaluation with Good	Percentage	Information
Meeting 1	18	9	50.0%	Some students Still answer in a way short and not complete
Meeting 2	18	14	77.8%	Answer more complete and systematic
Meeting 3	18	17	94.4%	Most of the student capable answer with true and independent

The data presented in Table 2 demonstrate a progressive improvement in students' ability to complete learning evaluations from the first to the third meeting. During the first meeting, students were still adapting to the Jigsaw learning structure, particularly the mechanisms of expert and home groups, resulting in limited material mastery and less optimal evaluation performance. As students became more familiar with group mechanisms and peer teaching, their ability to understand, explain, and apply the material improved, as reflected in better evaluation results. This finding indicates that peer learning, a central characteristic of Jigsaw, facilitates deeper and more sustainable understanding through active explanation and interaction. The improvement in learning outcomes resulted from the cumulative development of student activity, learning motivation, and material understanding, which mutually reinforced one another.

Discussion

The findings demonstrate that Jigsaw-based learning management improved learning quality through planning, organizing, implementation, facilitation, and evaluation (Moin et al., 2024; Wolyniak et al., 2026). This finding is consistent with Rokhmah and Subhi (2025), who emphasized that learning quality assurance requires structured planning, implementation, evaluation, and stakeholder commitment (Kebede et al., 2025; Townsend et al., 2024). Similarly, Robert et al., (2024) highlighted the importance of learning management in supporting educational quality (Vives et al., 2024). However, this study extends previous literature by showing how managerial functions operate through a cooperative learning structure. Rather than treating Jigsaw solely as an instructional technique, the findings position it as an effective management strategy that organizes participation, responsibility, interaction, and evaluation within effective learning.

The finding that student activity increased across three meetings is consistent with Hasanah and Himami (2021), who reported that cooperative

learning can strengthen student participation and activity (García-Taibo et al., 2024). It also supports Erviana et al. (2024), who identified improvements in cooperation and active participation through Jigsaw implementation (Hasibuan et al., 2024). The present study, however, provides a more process-oriented explanation of this improvement. Increased participation emerged because students received responsibilities within expert and home groups, creating positive interdependence and individual accountability (Jeppu et al., 2023; Zhan et al., 2024). Theoretically, this strengthens the interpretation of cooperative learning as a socially structured process. Practically, lecturers can distribute meaningful roles to reduce passivity and equalize participation.

The improvement in learning motivation also corresponds with Nopiyanto and Raibowo (2020), who found that Jigsaw can enhance students' motivation and learning outcomes. The present findings indicate that motivation developed through students' perceived responsibility toward success (Y. Chen et al., 2025; Khodadadeh et al., 2025). Students became more serious because they needed to master materials before explaining them to peers. This finding enriches existing literature by identifying responsibility as an important mechanism connecting cooperative structures with motivation (L. Chen, 2025). Theoretically, it suggests that motivation in Jigsaw is not merely generated by enjoyable interaction but also by accountability. Practically, lecturers should design tasks that make every student's contribution necessary for learning and group learning (Lee et al., 2023).

The improvement in material understanding supports Jainal and Shahrill (2021), who emphasized peer teaching and individual responsibility as mechanisms within Jigsaw learning (Darabi et al., 2024). The present findings similarly show that students developed deeper understanding when required to explain assigned materials to peers. This process encouraged students to reorganize information, clarify concepts, and identify gaps in their own understanding (C.-M. Chen & Huang, 2024; Izmi et al., 2025). Compared with previous studies that frequently emphasize achievement outcomes, this study highlights the cognitive process underlying improvement. Theoretically, the findings strengthen a constructivist interpretation of Jigsaw, in which knowledge develops through interaction and explanation (Stokstad et al., 2026). Practically, peer teaching should remain central when lecturers implement Jigsaw.

The improvement in evaluation performance from 50.0% in the first meeting, to 77.8% in the second, and 94.4% in the third confirms that changes in learning processes were accompanied by improvement. This finding is consistent with Maryati et al. (2024), who reported that Jigsaw can improve student activity and learning outcomes through individual responsibility (Lin et al., 2024). It also supports Hamalik's (2001) view that learning outcomes reflect the quality of the learning process (Gallagher-Ford et al., 2025). Nevertheless, this study contributes by connecting evaluation improvement with a cumulative sequence of activity, motivation, peer interaction, and understanding. Practically, repeated Jigsaw cycles and formative evaluation can monitor learning development.

Overall, the findings contribute theoretically by reconceptualizing Jigsaw as a learning management strategy rather than merely a cooperative instructional model. The integration of planning, organizing, implementation, facilitation, and evaluation with activity, motivation, understanding, and outcomes provides a clearer explanation of how Jigsaw improves learning quality. This perspective complements Rokhmah et al. (2024) concerning quality management in Islamic education while extending Jigsaw literature toward managerial integration in higher education (Kilpeläinen-Pettersson et al., 2025). Practically, the model offers lecturers a framework for designing participatory learning, distributing responsibility, monitoring progress, and evaluating achievement. Its contribution lies in connecting cooperative pedagogy with learning management in Islamic higher education.

CONCLUSION

This study concludes that the systematic implementation of the Jigsaw method through planning, organizing, implementation, facilitation, and evaluation can comprehensively improve learning quality in Islamic Education Management higher education. The key lesson is that Jigsaw becomes more effective when students are given clear responsibilities, opportunities for peer teaching, and structured collaborative interaction, resulting in increased activity, motivation, material understanding, and learning outcomes. Theoretically, this study contributes by positioning Jigsaw not merely as a cooperative learning technique but as an integrated learning management strategy that connects instructional processes with measurable learning quality. Practically, the findings provide lecturers with a framework for developing active and student-centered learning. However, the study was limited to one study program, one course, and a short implementation period. Future research should involve larger samples, diverse institutions, longer interventions, and mixed-method or experimental designs.

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