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Managing learning communities to improve student learning outcomes: A systematic literature review

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ABSTRACT	ARTICLE INFO
This study aims to analyze the management of learning communities as a strategy to improve student learning outcomes through a Systematic Literature Review (SLR). The review covered academic literature published between 2018 and 2024, indexed in the Directory of Open Access Journals (DOAJ). A total of 10 eligible articles were selected and analyzed using qualitative content analysis, which consisted of four stages: open coding, axial coding, selective coding, and theoretical coding. The findings led to an integrative model of learning community management, encompassing four fundamental dimensions: structural, functional, contextual, and impact on learning outcomes. The structural dimension highlights the importance of competence stratification, role rotation, and multi-stakeholder coordination. The functional dimension involves knowledge sharing, systematic reflection, and the transformation of pedagogical practices. The contextual dimension emphasizes adaptability to socio-cultural conditions, the use of technology, and the accommodation of diverse learning needs. Meanwhile, the impact dimension includes improvements in cognitive competence, strengthening of non-cognitive aspects, institutional capacity, and school identity. The study also identifies moderating variables, including transformative leadership, institutional policy support, and integrated learning infrastructure.	*Article History:* *Received: 21 May 2025* *Revised: 2 Sep 2025* *Accepted: 11 Sep 2025* *Available online: 6 Oct 2025* *Publish: 28 Nov 2025* *Keywords:* *collaborative education; educational management; learning community; learning outcomes* **Open access** ⊛ Inovasi Kurikulum is a peer-reviewed open-access journal.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengelolaan komunitas belajar sebagai strategi peningkatan capaian belajar murid melalui pendekatan Systematic Literature Review (SLR). Kajian dilakukan terhadap literatur akademik yang dipublikasikan pada periode 2018–2024 dan terindeks dalam Directory of Open Access Journals (DOAJ). Proses seleksi menghasilkan 10 artikel yang memenuhi kriteria inklusi, dianalisis menggunakan teknik analisis konten kualitatif dengan empat tahapan: open coding, axial coding, selective coding, dan theoretical coding. Hasil analisis menunjukkan terbentuknya model integratif pengelolaan komunitas belajar yang mencakup empat dimensi fundamental, yakni struktural, fungsional, kontekstual, dan dampak terhadap capaian belajar. Dimensi struktural menekankan pentingnya stratifikasi kompetensi anggota, rotasi peran, dan koordinasi multistakeholder. Dimensi fungsional mencakup berbagi pengetahuan, refleksi sistematis, dan transformasi praktik pedagogis. Dimensi kontekstual menegaskan adaptabilitas terhadap kondisi sosio-kultural, pemanfaatan teknologi, dan keragaman kebutuhan pembelajaran. Sementara itu, dimensi dampak mencakup peningkatan kompetensi kognitif, penguatan aspek non-kognitif, kapasitas institusional, serta identitas sekolah. Penelitian ini juga mengidentifikasi variabel moderator berupa kepemimpinan transformatif, dukungan kebijakan institusional, dan infrastruktur pembelajaran terintegrasi.

Kata Kunci: capaian belajar; komunitas belajar; pendidikan kolaboratif; pengelolaan pendidikan

INTRODUCTION

The rapid development of technology has generated numerous positive impacts across various sectors, including education. At the same time, contemporary education faces increasingly complex challenges alongside technological advancements and shifts in learning paradigms (Rahman, 2024; Rosyiddin *et al*., 2023). The phenomenon of educational disruption has intensified the demand for innovative learning approaches capable of accommodating students' learning needs in a holistic manner (Khaira *et al*., 2023; Koul & Nayar, 2021). Student learning outcomes are no longer perceived as isolated results detached from the social context of learning; rather, they are understood as manifestations of complex interactions among multiple factors, including learning environments, pedagogical methods, and students' socio-psychological dynamics (Ronald *et al*., 2025). Within this context, learning communities have gained significant attention as a potential instrument for stimulating, facilitating, and optimizing both collective and individual knowledge construction processes (Murdjoko *et al*., 2025).

Learning communities represent a systemic entity grounded in the principles of collaboration, dialogic interaction, and collective problem-solving. In Indonesia, the implementation of learning community concepts has undergone significant evolution, particularly in the post-COVID-19 pandemic era, which compelled educational institutions to reconfigure conventional learning models (Utami *et al*., 2024). Conceptually, learning communities are understood as manifestations of shared learning processes that emerge through the active participation of members in collectively enacted social practices (Cao & Yu, 2023). Effective management of learning communities requires a pedagogical infrastructure that supports collaborative, reflective, and transformative learning activities (Fauzan & Miyono, 2023).

Previous studies have explored various dimensions of learning communities and their implications for learning outcomes. One study identified a positive correlation between students' participation in learning communities and increases in intrinsic motivation as well as students' metacognitive abilities (Novita & Radiana, 2024). Other findings indicate that the integration of learning communities into secondary school curricula leads to significant improvements in students' critical thinking skills and collaborative competencies (Steven *et al*., 2024). In addition, the structural and functional aspects of learning communities have been examined, demonstrating the importance of instructional design that supports substantive interaction and collective knowledge construction (Markauskaite *et al*., 2022).

Rapid technological development has also created opportunities for students to integrate technology into their learning communities. Consequently, previous research has identified a technological dimension of learning communities as an emerging focus, particularly through analyses of digital platforms used as facilitators of virtual learning communities (Hakim & Yulia, 2024). These findings suggest that technology-based learning communities can overcome the spatio-temporal limitations of conventional learning, while simultaneously introducing new challenges related to accessibility and digital literacy. Meanwhile, studies on leadership within learning communities highlight the crucial role of educators as facilitators who mediate interactions and provide cognitive scaffolding to support students' learning processes (Nabawi, 2023).

Although previous studies have explored various specific dimensions of learning communities, the existing literature still reveals a significant gap in relation to comprehensive models for learning community management that integrate structural, functional, and contextual aspects in a holistic manner. Most prior research has tended to focus on particular components in isolation, without offering a systematic framework capable of supporting the comprehensive implementation and evaluation of learning communities. This gap becomes increasingly relevant within the Indonesian educational context, which is characterized by socio-economic heterogeneity, limitations in educational infrastructure, and variations in educators' pedagogical competencies.

The scientific novelty of this study lies in the development of an integrative model for learning community management that simultaneously considers contextual and structural variables. In contrast to previous approaches that are largely partial in nature, this study proposes a comprehensive conceptual framework that integrates pedagogical, psychological, and sociological dimensions of learning communities. The proposed model is grounded in empirical analysis of learning community management practices across diverse educational contexts, taking into account variability in student characteristics, educational infrastructure, and institutional policies.

The research problems addressed in this study concern: (1) the structural and functional characteristics of an effective learning community management model within the Indonesian educational context; (2) the extent to which the implementation of such a model correlates with improvements in students' learning outcomes across cognitive, affective, and psychomotor domains; and (3) the contextual factors that moderate the relationship between learning community management and students' learning outcomes. Based on these issues, the objective of this study is to develop and validate a comprehensive learning community management model that can be applied across diverse educational settings in Indonesia.

More specifically, this study aims to identify and analyze the structural and functional components of an effective learning community management model, to evaluate the impact of its implementation on students' learning outcomes, and to explore contextual factors that moderate the effectiveness of learning community management in enhancing learning achievement. The findings of this study are expected to contribute significantly to the advancement of pedagogical practices and educational policies that support the optimization of students' learning potential through effective learning community management.

LITERATURE REVIEW

Conceptualization of Learning Communities

The concept of learning communities has undergone significant evolution within contemporary educational discourse. Epistemologically, learning communities are rooted in the social constructivist paradigm, which views knowledge as a product of collective construction through meaningful social interaction (Saleem *et al*., 2021). Within Wenger's theoretical framework, a learning community is defined as a group of individuals who share a common interest, concern, or passion for a particular topic and who deepen their knowledge and expertise in that domain through sustained interaction (Abedini *et al*., 2021). This conceptualization emphasizes the social dimension of learning, manifested through collaborative, dialogical, and reflective practices (Ellyatt, 2025).

Recent developments in the theorization of learning communities indicate a shift from conventional models that are static and highly structured toward more dynamic models that emphasize role fluidity, multidimensional interaction, and the co-construction of knowledge. Within this framework, the fundamental elements of learning communities include positive interdependence, whereby each member contributes uniquely to the achievement of shared goals; supportive interaction, which facilitates the exchange of ideas and the provision of constructive feedback; individual and collective accountability, which underscores shared responsibility for learning outcomes; and the development of interpersonal skills, which function both as prerequisites for and outcomes of active participation. Collectively, these elements demonstrate that learning communities serve not only as environments for academic learning but also as spaces for cultivating collaborative values that are essential to the success of educational processes (Prasetyawan, 2020).

Structural and Functional Dimensions of Learning Communities

The structural dimension of learning communities encompasses organizational aspects that define their operational parameters (Tarmizi, 2019). Based on structural configurations, learning communities can be classified into several types: formal learning communities that are integrated into the curricular and administrative structures of educational institutions; semi-formal learning communities that operate on the periphery of formal education systems while maintaining institutional affiliation; informal learning communities that emerge spontaneously based on shared interests or learning needs; and virtual learning communities that utilize digital platforms as media for interaction and collaboration (Castrillon, 2020).

Meanwhile, the functional dimension of learning communities relates to the operational mechanisms that facilitate the achievement of pedagogical objectives (Adien *et al*., 2025). The core functions include a cognitive function that supports knowledge construction through discussion, collaborative problem-solving, and joint projects; a social function that fosters group cohesion and collective identity through interpersonal interaction and the development of shared norms; a motivational function that stimulates and sustains student engagement through peer support and recognition of individual contributions; a reflective function that encourages metacognition and self-evaluation through critical dialogue and feedback; and a transformative function that enables shifts in perspective and the development of professional identity through active participation in the community's social practices (Zamiri & Esmaeili, 2024). Accordingly, the structural and functional dimensions of learning communities are complementary in nature, wherein structural elements provide a stable organizational framework, while functional elements drive the interactive dynamics and pedagogical processes necessary to achieve learning objectives.

Management of Learning Communities: Principles and Strategies

Effective management of learning communities requires a systematic approach capable of accommodating the complex interactions among pedagogical, psychological, and sociological factors (Spaho *et al*., 2025). Conceptual frameworks for learning community management emphasize five principal dimensions: pedagogical design, which focuses on the formulation of learning objectives, the selection of learning activities, and the development of instructional materials; facilitation of interaction, which highlights the creation of a dialogic learning climate and the regulation of group dynamics; cognitive scaffolding, which provides instructional support aligned with students' zones of proximal development; formative evaluation, which prioritizes continuous assessment of both learning processes and outcomes; and capacity building, which is directed toward enhancing students' abilities to manage independent as well as collaborative learning (Eden *et al*., 2024).

The implementation of learning community management strategies is strongly influenced by socio-cultural contexts and institutional infrastructure (Murdjoko *et al*., 2025). Within the Indonesian educational context, which is characterized by diverse conditions, an adaptive approach is imperative. Relevant contextualization strategies include the integration of local cultural values as the normative foundation of the learning community, the utilization of local wisdom as a source of knowledge and learning inspiration, the application of multilingual approaches that accommodate students' linguistic diversity, the use of technology aligned with the community's levels of accessibility and digital literacy, and the development of participatory mechanisms that engage multiple stakeholders in decision-making processes (Triarini *et al*., 2024).

Implications of Learning Communities for Learning Outcomes

Numerous empirical studies have confirmed a positive correlation between participation in learning communities and improvements in students' learning outcomes (Nurgas *et al*., 2025). Learning outcomes influenced by learning communities encompass four primary dimensions. The cognitive dimension relates

2258

to conceptual understanding, analytical skills, and mastery of factual knowledge. The metacognitive dimension is associated with awareness of one's own thinking processes, self-regulation in learning, and problem-solving strategies. The affective dimension includes attitudes toward learning, intrinsic motivation, and academic resilience. Meanwhile, the social dimension pertains to communication skills, collaborative abilities, and interpersonal sensitivity (Hidayat, 2024; Islami *et al*., 2024).

The mechanisms through which learning communities facilitate improvements in learning outcomes are multifaceted. These processes may operate through cognitive pathways, whereby dialogic interactions within the community stimulate knowledge elaboration and the construction of new understanding. Motivational pathways emerge through social support and recognition that enhance students' self-efficacy and engagement. Regulatory pathways are manifested through community norms and expectations that encourage the development of self-regulation and academic discipline. In addition, identity-related pathways play a crucial role, as participation in community practices contributes to the formation of learners' identities as both competent individuals and valued members of a learning community (Avissar & Yondler, 2025; Claudel & González, 2024).

Nevertheless, the impact of learning communities on learning outcomes is not always linear or universal. Individual student characteristics, facilitator competence, instructional design, and institutional climate may function as moderating factors that influence both the magnitude and direction of these effects. Therefore, effective models for managing learning communities must be designed in an adaptive and responsive manner to accommodate variability in implementation contexts and the specific needs of participants.

METHODS

This study employed a Systematic Literature Review (SLR) approach with qualitative content analysis. This method was selected because it enables the mapping of current knowledge on a particular topic, the identification of gaps within the literature, and the determination of directions for future research (Snyder, 2019). Data were collected through a systematic search of academic literature published between 2018 and 2024, limited exclusively to peer-reviewed journal articles indexed in the Directory of Open Access Journals (DOAJ). The selection of DOAJ as the primary database was based on considerations of quality and credibility. DOAJ is widely recognized as an international index that includes only open-access journals adhering to stringent publication standards and rigorous peer-review mechanisms, thereby ensuring scientific credibility. Its open-access nature allows unrestricted retrieval of literature without financial barriers, while its broad multidisciplinary scope facilitates the identification of relevant studies related to learning communities, learning outcomes, and collaborative education. Furthermore, the independence and transparency of DOAJ's journal selection process support academic integrity and minimize the risk of exposure to predatory publishing practices.

The literature selection process followed the SLR framework recommended by Kitchenham and Charters (2007) in *Guidelines for Performing Systematic Literature Reviews in Software Engineering*, which emphasizes systematic, transparent, and replicable procedures. The initial stage involved a literature search within the DOAJ database using the keywords "learning community," "learning outcomes," and "collaborative education." This search yielded 83 potential articles, which were subsequently screened based on titles and abstracts. Following this screening process, 31 articles met the inclusion criteria, namely: a focus on learning communities within formal education contexts, relevance to learning community management, discussion of the relationship with learning outcomes, and the provision of empirical data or substantial conceptual analysis. Articles that met these criteria were then subjected to a quality appraisal stage using the CASP Systematic Review Checklist to assess methodological and theoretical quality in accordance with established academic standards. This process resulted in a final

corpus of 10 articles that were included for in-depth analysis. A concise overview of the research stages is presented in **Figure 1**.
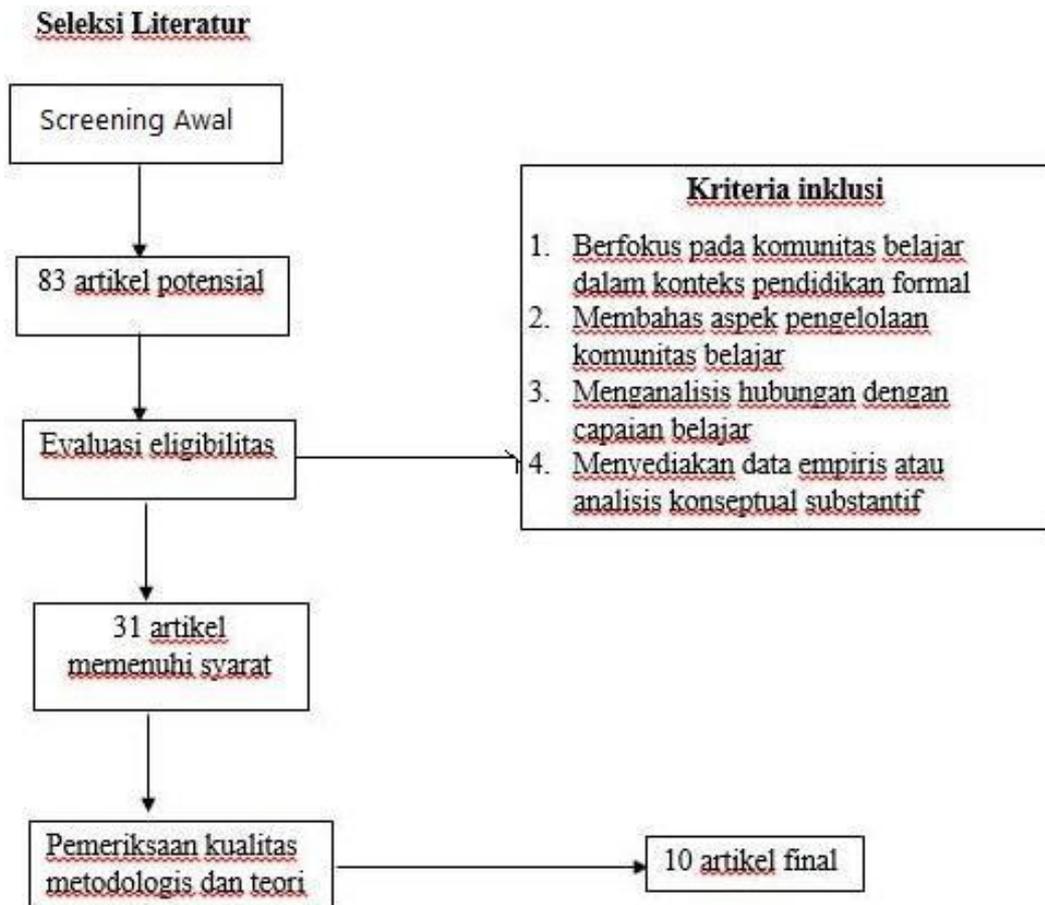
Figure 1. Literature Selection Flow Diagram
Source: Research Data, 2025

To enhance the credibility of the findings, validation strategies were implemented through source triangulation, peer debriefing, member checking, and the development of an audit trail, in accordance with the principles of qualitative research validity as formulated by Lincoln and Guba in *Naturalistic Inquiry*.

The subsequent stage involves the data analysis process, which is illustrated in **Figure 2** as follows.

2260
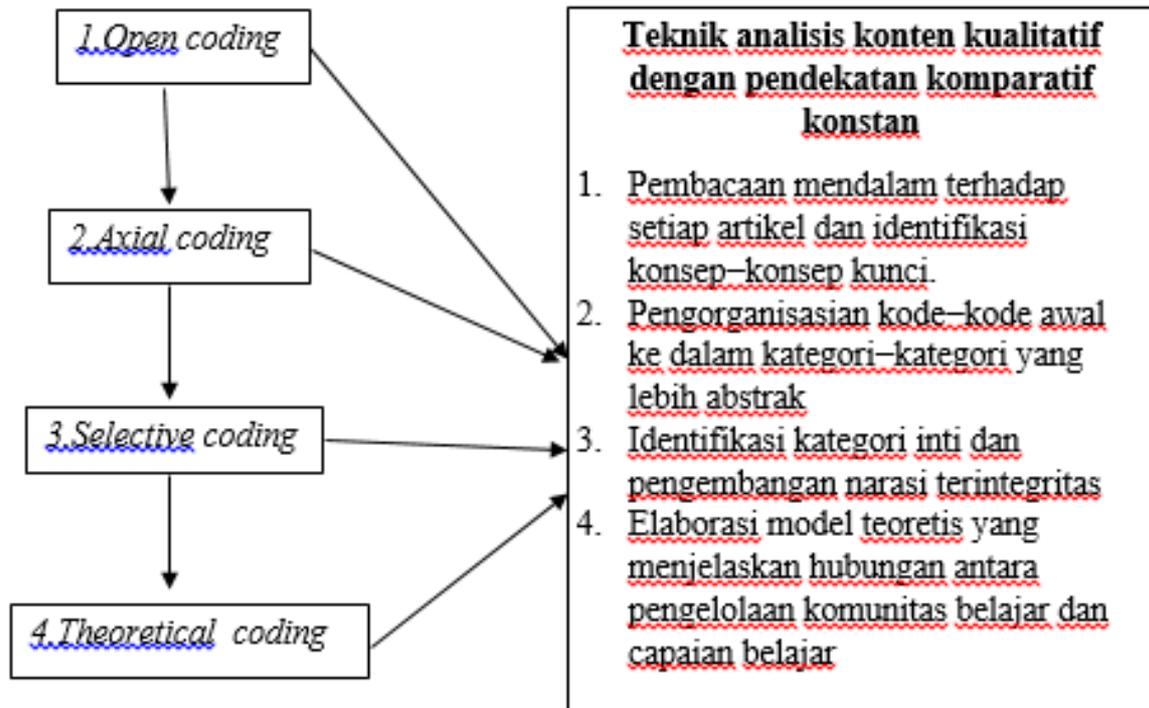
Figure 2. Data Analysis Flow Diagram
Source: Research Data, 2025

Figure 2 illustrates the data analysis process, employing qualitative content analysis through a constant comparative approach, conducted in sequential, interrelated stages. The analytical approach adopted is *qualitative content analysis* as described by Mayring in *"Qualitative Content Analysis: Theoretical Foundation, Basic Procedures and Software Solution"*, combined with the *constant comparative method* proposed by Strauss and Corbin in *"Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory"*. Stage 1 (Open coding), the researcher conducted an in-depth reading of each article to identify key concepts emerging from the data. Stage 2 (Axial coding), the initial codes were organized into more abstract categories, allowing meaningful patterns to begin to emerge. Stage 3 (Selective coding), core categories were identified and integrated into a coherent narrative in order to clarify the relationships among findings. Stage 4 (Theoretical coding), a theoretical model was elaborated to explain the relationship between the management of learning communities and learning outcomes. Taken together, these stages form a systematic and coherent analytical flow that supports the development of well-grounded and conceptually integrated research findings.

RESULTS AND DISCUSSION

Based on this study, content analysis was conducted on **1**0 selected articles through four sequential stages: 1) Open coding; 2) Axial coding; 3) Selective coding; and 4) Theoretical coding.

Open Coding

At the initial stage, each article was analyzed in depth to identify key concepts relevant to the management of learning communities and their impact on students' learning outcomes. This process yielded 120 initial codes, encompassing key ideas such as teacher–student collaboration, project-based practices, the use of digital media, and the enhancement of pedagogical competence. These codes served as the foundational basis for the categorization process in the subsequent stage.

Axial Coding

The next stage focused on organizing the initial codes into more abstract categories based on thematic similarities and implementation contexts. For instance, codes related to teacher–student collaboration and group discussions were consolidated into the category *learning community interaction and collaboration*, while codes concerning the use of flipbooks and digital flipbooks were grouped under the category *media innovation and instructional strategies*. Through this process, 40 categories were formed, representing various structural, functional, and contextual aspects of learning communities.

Selective Coding

This stage aimed to refine the established categories into more focused core themes. Among the 40 categories, the researchers identified 10 core categories that are critical to the effectiveness of learning community management. These include collaboration among community members, innovative and adaptive instructional strategies, continuous evaluation and reflection, and leadership support and institutional policy. These core categories were then synthesized into a conceptual narrative explaining how learning communities can significantly influence students' learning outcomes.

Theoretical Coding

In the final stage, the identified core categories were integrated into a comprehensive theoretical model. The analysis identified four main dimensions that explain the effectiveness of learning communities. The structural dimension emphasizes the importance of member competency stratification, role rotation, and multi-stakeholder coordination. The functional dimension highlights knowledge-sharing activities, systematic reflection, and the transformation of pedagogical practices. The contextual dimension underscores adaptability to socio-cultural conditions, the utilization of technology, and the accommodation of diverse learning needs. Meanwhile, the impact dimension reflects the ultimate outcomes, including improvements in cognitive and non-cognitive competencies, strengthened institutional capacity, and the formation of a more collaborative school identity.

Based on the content analysis, the following synthesis table presents the implementation context, learning community dimensions, primary impacts, and key findings of each study, as shown in **Table 1**.

Table 1. Research Findings Synthesis

Code	Author(s) and Year	Implementation Context	Emphasized Learning Community Dimension	Main Impact	Key Findings
1	(Resta & Kodri, 2023)	Pop-up book learning media implemented with Grade V students at SDN Ciangsana 04 Bogor using a quasi-experimental design.	Visual–innovative learning interaction compared to conventional instructional methods.	Pop-up books significantly improved students' learning outcomes compared to conventional media.	The experimental class achieved an average score of 92.32, higher than the control class score of 82.5, indicating that H_1 was accepted.

2262

Code	Author(s) and Year	Implementation Context	Emphasized Learning Community Dimension	Main Impact	Key Findings
2	(Aghata & Sanoto, 2025)	Digital flipbook integrated with a cooperative think–pair–share strategy among Grade IV students at SD Negeri Salatiga 06.	Student collaboration through paired and group discussions in a cooperative learning environment.	The strategy significantly improved students' mathematics learning outcomes.	The average score increased from 60 (pre-cycle) to 80 (Cycle II), with 96% of students achieving the Minimum Mastery Criteria (KKM).
3	(Paida & Sahriani, 2024)	SMKN 3 Gowa	Professional collaboration among teachers.	Improvement in students' technical skills and soft skills, as well as increased engagement in the learning process.	A strong focus on learning processes, learning outcomes, and a collaborative culture was identified as the key to success.
4	(Kuswanto, 2023)	New curriculum implementation with Grade VII students through group division based on diagnostic test results.	Shared understanding was fostered through gradual teacher explanations to support students' acceptance of the new system.	Gradual explanations helped reduce students' misconceptions and improved adaptation to the new curriculum.	Initially, students perceived group division as favoritism; however, through continuous clarification, they gradually understood the applied curriculum concept.
5	(Yusnidar & Syahri, 2022)	Chemistry Education university students.	Data-based learning community focused on identifying learning needs.	Improved student learning outcomes.	Learning outcomes showed a t-test value of 7.769 and were more optimal when implemented through blended learning.
6	(Nugroho, 2021)	Grade XI vocational high school students in Salatiga City	Instructional strategy using blended learning with a class demonstration model.	The approach overcame online learning difficulties and improved student achievement in quadratic and composite functions.	The average score increased from 66.94 (pre-cycle) to 85.00 (Cycle II), while class mastery improved from 49.07% to 72.22%.
7	Wulandari & Imron, 2025	Clinical supervision is implemented at the playgroup level, led by the school principal.	Collaboration between principals and teachers through interviews, training, and constructive feedback.	Clinical supervision significantly improved teachers' pedagogical competence and instructional quality.	Success depended on intensive principal training, scheduled programs, and collaboration among stakeholders.
8	(Yunita, 2025)	Small group coaching for private early childhood educators (PAUD, SPS, TPA) through cloud-based digital literacy workshops.	Personal interaction, non-formal atmosphere, and active participation in small groups.	The program significantly improved educators' digital skills, particularly in email use, cloud storage, and document collaboration.	Small-scale training with a personalized approach effectively accelerated technology adoption and supported sustainable digital transformation in non-formal education.
9	(Nurnajmi et al., 2024)	P5 program implemented through Community Service (KKN) activities at SDN 02 Cibodas to foster students' interest in agriculture.	Active participation, collaboration, and interactive education between KKN students and Grades 4–6 students.	The program significantly increased students' understanding of and interest in modern agriculture.	P5 demonstrated strong potential as an effective educational model for preparing competent and innovative millennial farmers.

Co de	Author(s) and Year	Implementation Context	Emphasized Learning Community Dimension	Main Impact	Key Findings
10	(Martini *et al*., 2025)	Project-Based Learning (PBL) was implemented in senior high school through plastic waste recycling projects.	Group collaboration, hands-on practice, and project-based evaluation.	PBL effectively enhanced students' understanding, skills, and awareness of plastic waste management.	The average project achievement reached 88.25%, with significant improvements in goal comprehension, evaluation skills, and waste management practices.

Source: Research Findings, 2025

Synthesis of Findings Based on Dimensions

Based on the results of the content analysis using the *constant comparative method*, this study's findings can be synthesized into four main dimensions: structural, functional, contextual, and impact. These four dimensions are interrelated and collectively form a conceptual framework explaining how learning communities are managed and how they influence students' learning outcomes. A summary of the synthesized findings is presented in **Table 2**.

Table 2. Synthesis of Research Findings

Dimension	Key Components / Mechanisms	Key Findings / Impacts
Structural	Member competency stratification; role and responsibility rotation; integration with institutional structures (curriculum, school management); multi-stakeholder coordination	Higher-level teachers mentor lower-level members, enabling systematic knowledge dissemination; regular meetings and facilitator rotation enhance implementation consistency; integration with school policies and management supports sustainability.
Functional	Knowledge and experience sharing; innovative collaboration; collective reflection and practice evaluation; transformation of pedagogical practices	Enhances members' pedagogical capacity; supports innovation and the use of educational technology; facilitates shared meaning-making through social interaction (*scaffolding*); emphasizes both learning processes and outcomes.
Contextual	Adaptation to socio-cultural conditions; responsiveness to infrastructure and resources; technology integration aligned with accessibility; accommodation of learner diversity	The effectiveness of learning communities depends on managerial capacity, data availability, and technology; contextualization enhances program relevance and sustainability; ICT flexibility and inclusivity support effectiveness across diverse conditions.
Impact	Improvement in students' cognitive achievement; enhancement of non-cognitive dimensions (discipline, engagement); increased teachers' pedagogical capacity; strengthened institutional capacity and school branding	Students' academic outcomes improve; teachers become more competent in classroom management, assessment, and innovation; schools demonstrate greater program consistency and improved institutional reputation.

Source: Research Findings, 2025

Table 2 provides a concise overview of the components, key mechanisms, and major findings related to the management of learning communities. However, to achieve a more comprehensive understanding, each dimension requires further elaboration. The following sections provide a detailed discussion of the

2264

structural, functional, contextual, and impact dimensions, along with supporting empirical examples that reinforce each dimension.

Structural Dimensions

The structural dimension relates to the organization and governance of learning communities. The analysis indicates that member competency stratification constitutes a crucial component, whereby grouping members based on similar competency levels or learning needs has proven effective in enhancing the quality of interaction and collaboration (e.g., Articles 4 and 8). Through such stratification, the learning process becomes more focused, as members operate within relatively comparable levels of difficulty, thereby reducing disparities in understanding among individuals. Moreover, homogeneous grouping facilitates the implementation of more targeted instructional strategies, enables the exchange of relevant ideas, and accelerates the achievement of learning objectives through reciprocal support among members. Beyond stratification, role rotation and multi-stakeholder coordination also play a significant role in ensuring the sustainability and effectiveness of learning communities. The involvement of various stakeholders, such as school principals, teachers, and university students, combined with systematic role rotation, contributes to shared responsibility and organizational continuity. Structured coordination mechanisms ensure that each element of the community functions optimally, as evidenced by findings from Articles 7 and 9.

Functional Dimensions

The functional dimension emphasizes the activities and practices that take place within learning communities. Knowledge sharing and pedagogical practice exchange emerge as the most prominent aspects. Nearly all reviewed studies (e.g., Articles 2 and 3) highlight the importance of exchanging ideas, instructional strategies, and teaching practices, enabling members to continuously learn from one another and improve their pedagogical skills. In addition, systematic reflection on both learning processes and outcomes has been shown to play a critical role in identifying successful practices as well as areas requiring improvement (Articles 7 and 10). This reflective process establishes a cycle of continuous improvement that consistently enhances the quality and effectiveness of learning communities. Through reflective dialogue and evaluative practices, communities are able to refine their approaches, adapt strategies, and sustain pedagogical innovation over time.

Contextual Dimensions

The contextual dimension underscores the importance of a community's capacity to adapt to its surrounding environment. Adaptability to socio-cultural conditions, as demonstrated in Articles 1 and 9, is a key factor in the success of learning communities, as it enables the integration of local contexts, learners' interests, and their specific educational needs. Such contextual sensitivity enhances relevance and fosters stronger engagement among participants. Furthermore, the utilization of technology, including data-driven learning communities and blended learning models (Articles 5 and 6), functions as a catalyst for strengthening interaction and facilitating learning processes within communities. When appropriately aligned with contextual conditions and technological accessibility, learning communities become more responsive, inclusive, and effective in supporting diverse learning trajectories.

Impact Dimensions

The impact dimension reflects the ultimate outcomes of effective learning community management on learning achievement. The analysis indicates notable improvements in both cognitive and non-cognitive competencies, manifested through enhanced academic performance as well as the development of soft skills, learner engagement, and learning motivation (Articles 1, 2, 5, 6, and 10). Beyond individual learning outcomes, strong collaboration within learning communities also contributes to the strengthening of institutional capacity and school identity. This process fosters a school culture oriented toward collaboration, innovation, and continuous improvement (Articles 3 and 7). Accordingly, the findings suggest that learning communities managed through a structurally sound, functionally dynamic, contextually adaptive, and impact-oriented approach are capable of optimizing learning outcomes while simultaneously cultivating resilient and competitive educational institutions.

Discussion

Structural Dimension of Learning Community Management

The findings indicate that the structural dimension functions as the operational framework for the implementation of learning communities. This structure encompasses competency stratification among members, role rotation, integration with institutional structures, and multi-stakeholder coordination mechanisms (Yuliarsih *et al*., 2024). Competency stratification enables more experienced teachers to mentor their peers through differentiated mentoring processes, which aligns with the principle of scaffolding in social constructivism that emphasizes the role of social interaction in knowledge construction (Saleem *et al*., 2021). Regular meeting structures, the rotation of resource persons, and integration with school curricula and management systems support the consistency and sustainability of learning communities, as highlighted in studies that identify the structural dimension as the organizational backbone of collaborative learning initiatives (Tarmizi, 2019).

These findings are consistent with previous research demonstrating that instructional design and collaborative structures contribute significantly to the effectiveness of learning communities (Markauskaite *et al*., 2022). Furthermore, the involvement of multiple stakeholders, effective information management, and leadership support, particularly the role of teachers as facilitators, strengthen the sustainability and resilience of community structures (Baco *et al*., 2022; Nabawi, 2023). Accordingly, the structural dimension functions not only as an organizational foundation but also as a strategic instrument for reinforcing collaborative interaction within learning communities.

Functional Dimension of Learning Community Management

The functional dimension is closely associated with the operational mechanisms that enable learning communities to achieve their pedagogical objectives (Aminah *et al*., 2024). Core activities within this dimension include knowledge sharing, innovative collaboration, collective reflection, and the transfer of pedagogical practices (Salamah *et al*., 2024). Social interactions among community members function as scaffolding for pedagogical capacity development, aligning with social constructivist theory as well as Wenger's framework of collaborative and reflective practice within learning communities (Abedini *et al*., 2021).

Furthermore, these reflective and collaborative functions demonstrate strong relevance to transformative learning, in which learning processes facilitate shifts in perspectives and pedagogical practices (Zamiri & Esmaeili, 2024). The emphasis on collective reflection also strengthens metacognitive mechanisms that support increased motivation and self-regulation. These findings are consistent with empirical studies

2266

indicating a positive correlation between participation in learning communities and improvements in intrinsic motivation and metacognitive skills (Novita & Radiana, 2024). Accordingly, the functional dimension serves as a primary instrument for activating transformative interaction dynamics within learning communities.

Contextual Dimension of Learning Community Management

Socio-cultural and institutional contexts strongly influence the effectiveness of learning communities. Moderating factors affecting implementation include school managerial capacity, technological infrastructure, and the integration of community activities with extracurricular or digital programs (Lukitasari et al., 2024). This perspective aligns with educational ecology theory, which emphasizes the interrelationships among microsystems, mesosystems, and educational policies in sustaining learning communities (Spours, 2024).

Within digital contexts, technology integration requires the application of the TPACK framework and the SAMR progression model to ensure that technology use moves beyond mere substitution toward the transformation of learning experiences. This view is reinforced by studies demonstrating that virtual learning communities can overcome spatial constraints, although they also introduce challenges related to digital literacy (Hakim & Yulia, 2024). Such contextualization is further aligned with the principles of Universal Design for Learning (UDL), which emphasize flexibility in accommodating diverse learner needs.

Additional empirical evidence supports the importance of the contextual dimension. Research conducted in Sekolah Penggerak programs indicates that the use of the Merdeka Mengajar Platform facilitates the expansion of learning communities beyond the physical boundaries of schools (Setiariny, 2023). These findings intersect with studies highlighting the importance of integrating learning communities into the curriculum to foster critical thinking and collaborative skills (Steven et al., 2024). Accordingly, the contextual dimension functions as a bridge linking policy frameworks, infrastructure readiness, and learner needs within the management of learning communities.

Impact of Learning Community Management on Learning Outcomes

The impact of learning communities is reflected in improvements in cognitive and non-cognitive learning outcomes, teachers' pedagogical competencies, and institutional capacity. From a cognitive perspective, learning communities contribute to students' conceptual understanding and analytical skills, while at the non-cognitive level they foster engagement, discipline, and collaborative skills (Baco et al., 2022). These findings align with studies that emphasize the significant influence of learning communities on both academic achievement and motivational–affective dimensions of learning (Nurgas et al., 2025).

Empirical evidence further demonstrates consistency with existing literature. Research conducted at SD St. Petrus Medan revealed a significant improvement in students' learning outcomes alongside strengthened disciplinary behaviors (Ginting & Yosefa, 2024). These results reinforce other studies highlighting the role of learning communities in developing critical thinking and collaborative competencies (Steven et al., 2024). At the institutional level, learning communities enhance instructional capacity, improve programmatic consistency, and contribute to school branding and reputation. In line with the Visible Learning meta-analysis, the effects of feedback and teacher collaboration fall within the high effect size category, indicating a strong positive correlation between learning community practices and the improvement of instructional quality.

Integrative Model of Learning Community Management

The synthesis of the structural, functional, contextual, and impact dimensions yields an integrative model that emphasizes the dynamic interaction among these dimensions. This model combines competency stratification, role rotation, reflective practices, contextual adaptation, and an explicit orientation toward learning outcomes (Harjaya & Idawati, 2022; Sierra-Huedo *et al*., 2023). Such an approach aligns with frameworks that stress the importance of systematic and adaptive management of learning communities (Spaho *et al*., 2025).

Within this model, the functional dimension can be explained by social constructivist theory, which highlights knowledge construction through interaction, and by social learning theory, which emphasizes the role of observation and peer feedback in learning processes (Sulo *et al*., 2022; Tullah, 2020). Collective reflection processes reflect the principles of double-loop learning and lesson study practices, which have been shown to shift the instructional core toward evidence-based learning practices (Markauskaite *et al*., 2022).

At the contextual dimension, the integration of technology through the TPACK and SAMR frameworks, alongside the application of Universal Design for Learning (UDL) principles, extends the effectiveness of learning communities. These findings are consistent with studies demonstrating the role of technology in expanding access to virtual learning communities (Hakim & Yulia, 2024). Moreover, program success is strongly influenced by policy and institutional support that ensures coherence between learning community initiatives and broader educational goals (Spours, 2024).

The impacts generated by learning communities within this model are consistent with findings that emphasize improvements in motivation, self-regulation, and the formation of learner identity through sustained community participation (Avissar & Yondler, 2025). Accordingly, this integrative model represents a holistic approach that synthesizes social constructivism, educational ecology, and contemporary instructional design frameworks in the management of learning communities within the Indonesian educational context.

From a theoretical perspective, this study makes a significant contribution to the development of learning community theory in the Indonesian context. The proposed integrative model extends conventional understandings of learning communities by systematically integrating structural, functional, contextual, and impact dimensions within a coherent framework. This approach offers a novel theoretical perspective that accounts for the complexity and variability of learning community implementation across diverse educational settings. From a practical perspective, the integrative learning community management model can serve as a referential framework for educational practitioners in implementing learning communities within their institutions. The model provides operational guidance that accommodates variability in implementation conditions, enabling adaptation to the specific characteristics and socio-cultural contexts of educational institutions.

Additional practical implications relate to educational policy development that supports learning community implementation. The findings indicate the critical importance of institutional and structural policy support in optimizing the potential of learning communities. Therefore, the development of policies that facilitate the integration of learning communities into institutional structures becomes imperative for educational policymakers.

CONCLUSION

Based on the synthesis of the literature, the management of learning communities encompasses four interrelated dimensions, namely structural, functional, contextual, and impact dimensions. The structural dimension ensures effective knowledge distribution and the sustainability of learning communities through

2268

competency stratification among members, role rotation, integration with institutional structures, and multi-stakeholder coordination. The functional dimension enables the achievement of pedagogical goals through knowledge sharing, innovative collaboration, collective reflection, and the transformation of teaching practices, wherein social interaction among members functions as a scaffolding mechanism for enhancing pedagogical capacity. The contextual dimension underscores that the effectiveness of learning communities depends on their adaptability to socio-cultural conditions, resource availability, technology integration, and the accommodation of learner diversity. Appropriate contextualization enhances both the relevance and sustainability of learning community initiatives. Meanwhile, the impact dimension is reflected in improvements in students' cognitive and non-cognitive learning outcomes, the strengthening of teachers' pedagogical competencies, and the enhancement of institutional capacity and school branding. Collectively, this synthesis produces a holistic and adaptive integrative model that is highly relevant for the implementation of learning communities in Indonesian schools.

Based on these findings, future research is encouraged to conduct empirical studies to examine the effectiveness of the integrative model across diverse school contexts, including settings with limited resources or heterogeneous student characteristics. Further studies may explore the interactions among learning community dimensions and their longitudinal impacts, as well as investigate the role of digital platforms and hybrid learning environments in expanding collaborative engagement. Research on non-academic success indicators, such as teachers' professional development, collaborative school culture, and institutional identity strengthening, is also essential. Moreover, the development of evidence-based evaluation instruments capable of assessing the contribution of learning communities to student achievement, teacher capacity, and school management will be critical for strengthening the implementation and sustainability of learning community programs.

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