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Integrating Deep Learning-based Instruction and Character Strengthening to Enhance Primary School Teachers' Competence

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ABSTRACT

Background: Primary education plays a strategic role in shaping students' foundational knowledge, attitudes, and character; therefore, the quality of instruction and teacher competence are key factors in improving educational outcomes. However, classroom practices remain largely dominated by surface learning approaches that emphasise memorisation and short-term cognitive achievement. **Objective:** This study aims to examine the relationship between deep learning–based instruction, character strengthening, and the enhancement of primary school teachers' competence. **Method:** The study employs a qualitative approach through a literature review, using critical analysis and theoretical synthesis of various scholarly sources and educational policy documents. **Result:** The findings indicate that deep learning–based instruction can enhance conceptual understanding, higher-order thinking skills, and the internalisation of character values when supported by teachers' pedagogical, professional, social, and personal competencies. **Conclusion:** Integrating these three aspects yields a holistic and sustainable learning framework that supports meaningful learning processes in primary education. **Contribution:** This research enriches theoretical perspectives on meaningful learning design by integrating character development with comprehensive teacher competence development.

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1. INTRODUCTION

Primary education occupies a strategic position within the education system as it serves as the initial stage in forming students' foundational knowledge, attitudes, and character. At this stage, students begin to develop ways of thinking, learning habits, and fundamental values that will influence their development in subsequent levels of education. Learning in primary schools is not only focused on content mastery but also on the development of critical, creative, and reflective thinking skills (Saputra et al., 2025). In addition, it is expected to foster positive social attitudes such as responsibility, discipline, and empathy (Alfidyah, 2025). Therefore, teachers play a crucial role as key actors in determining the direction and quality of the learning process through meaningful, contextual, and student-centred instructional design (Darling-Hammond et al., 2017).

Quality learning is characterized by the integration of planning, implementation, and evaluation that align with students' needs and characteristics (Auliyah et al., 2024). Effective instructional planning must consider clear objectives, relevant strategies, and approaches that encourage active student engagement (Biggs, 1999). During the implementation phase, teachers are expected to create a conducive and inclusive learning environment that promotes exploration and collaboration. Meanwhile, evaluation is not only used to measure learning outcomes but also serves

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as a reflective tool for continuously improving the learning process (Anderson et al., 2001). In this context, character strengthening becomes an integral component internalized through humanistic pedagogical interactions, positive habituation, and teachers' role-modelling in everyday classroom life.

However, empirical realities reveal a gap between ideal conditions and actual classroom practices in primary education (Hilman & Mutharik, 2026; Raihan, 2025). Many learning processes are still dominated by surface learning approaches that emphasise memorisation, routine task completion, and short-term academic achievement (Widagdo, 2024). Learning activities tend to be teacher-centred, with one-way interactions that limit students' opportunities for participation (Fullan, 2016). As a result, students have limited opportunities to explore ideas, ask questions, and develop a deeper understanding of learning materials.

This phenomenon gives rise to several issues in primary education, particularly related to the low quality of students' learning experiences. Learning that focuses on memorisation does not provide sufficient opportunities for students to develop higher-order thinking skills, such as analysing, evaluating, and creating (Marton & Säljö, 1976). Furthermore, the connection between learning materials and real-life contexts is often overlooked, resulting in knowledge that is disconnected from everyday experiences (Kolb, 1984). This condition also affects students' learning motivation, as the learning process is perceived as less meaningful and less relevant to their needs.

Several theoretical studies emphasize the importance of shifting the learning paradigm toward deeper learning approaches (Wafa et al., 2025). Deep learning positions students as active subjects who are engaged in constructing knowledge through exploration, reflection, and social interaction (Adnyana, 2024). It emphasizes strong conceptual understanding, the ability to connect concepts, and the application of knowledge across diverse contexts (Mujtahid et al., 2025). Moreover, this approach integrates cognitive, affective, and social dimensions, ensuring that learning is not solely focused on intellectual aspects but also on the development of attitudes and values.

Previous studies indicate that implementing deep learning improves the quality of learning (Zafirah et al., 2025). Other studies reveal that students engaged in deep learning–based instruction tend to demonstrate better critical thinking skills, creative problem-solving abilities, and deeper conceptual understanding (Khotimah & Abdan, 2025). On the other hand, several studies highlight the importance of character strengthening in the learning process, which can be achieved by integrating moral values into contextual learning activities (Dahirin & Rusmin, 2024; Madyarini & Wijayanti, 2025). However, most studies still focus on student learning outcomes and have not sufficiently examined their direct relationship with teacher competence.

Based on this review, there is a research gap: the relationship among deep learning–based instruction, character strengthening, and the enhancement of primary school teachers' competence has not been comprehensively analyzed within a unified framework. In fact, these three aspects are closely interconnected and mutually reinforcing in determining the quality of learning. Teachers with high competence are more likely to design meaningful learning experiences, while high-quality learning provides opportunities for students' character development. Therefore, a study that integrates these three aspects conceptually and systematically is necessary.

This study aims to examine in depth the relationship among deep learning–based quality instruction, character strengthening, and the enhancement of primary school teachers' competence. This study is expected to enrich theoretical perspectives on instructional design that focus not only on academic achievement but also emphasize character development and the continuous improvement of teacher competence. Furthermore, the findings are expected to serve as a reference for designing educational policies and practices that better align with the demands of 21st-century education.

2. METHOD

2.1 Research Design

This study employs a qualitative approach using a library research design. This design was selected because the study focuses on conceptual analysis and the development of a theoretical framework for quality learning grounded in deep learning, character strengthening, and primary school teacher competence. A qualitative approach enables the researcher to deeply understand, interpret, and construct meaning from various theories and research findings. Through this design, the study aims to produce an integrative and systematic conceptual synthesis as a foundation for understanding the relationships among the variables examined.

2.2 Research Object

The object of this study consists of concepts, theories, and research findings related to deep learning–based instruction, character education, and primary school teacher competence. The object of analysis does not involve indi-

viduals or field phenomena but rather represents knowledge derived from various scientific literature sources. The main focus is on examining how these three concepts interact and form a framework for meaningful, high-quality learning. Therefore, the research object is conceptual and is critically analyzed to obtain a comprehensive understanding.

2.3 Data Collection

Data were collected through documentation techniques by identifying, reviewing, and compiling relevant literature sources. The data sources consist of primary and secondary sources. Primary sources include key reference books addressing learning theories, deep learning concepts, character education, and teacher competence. Secondary sources include national and international scholarly journal articles, educational policy documents, and research reports relevant to the study focus. Sources were selected based on criteria such as relevance, author or institutional credibility, and timeliness of the information, to ensure the validity and reliability of the data.

2.4 Data Analysis

Data analysis was conducted using a qualitative descriptive-analytical approach through several systematic stages. The first stage involved data reduction, which consisted of selecting and focusing on literature directly related to the research topic. The second stage was categorization, grouping key concepts related to deep learning, character strengthening, and teacher competence. The third stage involved critical and comparative analysis by examining various theoretical perspectives and research findings to identify similarities, differences, and their implications. The final stage was conceptual synthesis, in which a coherent, integrative, and comprehensive framework was formulated. The validity of the data was ensured through rigorous source examination, consistency in the analytical process, and the use of credible scholarly references, resulting in strong theoretical validity and meaningful contributions to the development of quality learning in primary education.

3. RESULT AND DISCUSSION

3.1 Result

The findings indicate that quality learning in primary education through deep learning is characterized by an emphasis on conceptual understanding, active student engagement, and the ability to connect knowledge to real-life contexts. This approach has been shown to promote the development of higher-order thinking skills, such as analysing, evaluating, and creating, thereby shifting learning away from mere memorisation. In addition, deep learning–based instruction strengthens students' character through reflective, collaborative, and contextual learning activities, enabling values such as responsibility, honesty, and independence to be internalised more meaningfully.

On the other hand, the findings reveal that the successful implementation of deep learning is highly dependent on teacher competence across pedagogical, professional, personal, and social dimensions. Teachers function as designers and facilitators of learning, capable of creating meaningful, student-centred learning experiences. The results also demonstrate a mutually reinforcing relationship among deep learning, character strengthening, and teacher competence in shaping quality learning. However, challenges remain, including the dominance of conventional teaching practices and assessment systems that emphasize short-term cognitive achievement. Overall, integrating these three aspects forms a holistic, sustainable learning framework to improve the quality of primary education.

Table 1. Research Findings

No	Aspect Examined	Key Findings	Implications
1	Learning Characteristics	Learning is still dominated by surface learning focused on memorization and short-term achievement	A shift toward learning that emphasizes deep understanding is required
2	Deep Learning	Emphasizes conceptual understanding, interconnection of concepts, and contextual learning	Enhances the quality of more meaningful learning processes
3	Thinking Skills	Promotes the development of higher-order thinking skills (HOTS): analysis, evaluation, and creation	Students become more critical, reflective, and creative

No	Aspect Examined	Key Findings	Implications
4	Character Strengthening	Character values (honesty, responsibility, cooperation, independence) are integrated into the learning process	Character develops naturally through learning experiences
5	Teacher's Role	Teachers act as facilitators, motivators, and instructional designers	Improves the quality of humanistic pedagogical interactions
6	Teacher Competence	Pedagogical, professional, social, and personal competencies are key success factors	Teachers become more adaptive, reflective, and professional
7	Concept Integration	Deep learning, character strengthening, and teacher competence are interconnected and mutually reinforcing	A holistic learning system is established
8	Implementation Challenges	Persistence of conventional teaching practices and cognitively oriented assessment systems	Transformation of learning paradigms and assessment systems is required
9	Learning Impact	Learning becomes more meaningful, contextual, and sustainable	Improves the overall quality of primary education

The research findings indicate that transforming learning in primary education requires a shift from surface learning approaches toward deep learning–based instruction that emphasises conceptual understanding, the interconnectedness of knowledge, and the development of higher-order thinking skills. In this process, character strengthening is not a separate component but is naturally integrated through reflective, collaborative, and contextual learning activities.

The successful implementation of this approach depends heavily on teacher competence, encompassing pedagogical, professional, social, and personal dimensions. In this regard, teachers serve not only as facilitators but also as designers of meaningful learning experiences. Furthermore, the findings highlight a mutually reinforcing relationship among deep learning, character strengthening, and teacher competence in shaping a holistic learning system.

However, challenges remain, including the persistence of conventional teaching practices and assessment systems that emphasise short-term cognitive achievement. Therefore, continuous transformation efforts are required to ensure that learning becomes more relevant, meaningful, and capable of comprehensively improving the quality of primary education.

Based on a theoretical review of deep learning–based instruction, character strengthening, and teacher competence, a conceptual framework is needed to illustrate the relationships among these components systematically. This framework serves as a foundation for understanding how these three aspects interact in enhancing the quality of learning. The framework is presented in the following table.

Table 2. Conceptual Framework for the Integration of Deep Learning, Character Strengthening, and Teacher Competence

Main Component	Key Dimensions	Implementation Focus in Learning	Implications for Learning Quality
Deep Learning	Conceptual understanding	Learning oriented toward meaning, conceptual connections, and knowledge transfer	Students are able to connect knowledge with real-life contexts
	Higher-order thinking skills (HOTS)	Analysis, evaluation, reflection, and complex problem-solving	Enhances critical and creative thinking skills
	Contextual learning	Use of authentic problems and meaningful learning experiences	Learning becomes more relevant and meaningful
Character Strengthening	Moral and ethical values	Integration of values such as honesty, responsibility, discipline, and empathy in learning activities	Character is developed continuously
	Attitudes and behavior	Development of positive habits through role modeling and reflection	Character is inseparable from the learning process
	Self and social awareness	Collaborative and reflective learning	Enhances social and emotional intelligence
Teacher Competence	Pedagogical competence	Designing deep learning and authentic assessment	Learning becomes structured and understanding-oriented

Main Component	Key Dimensions	Implementation Focus in Learning	Implications for Learning Quality
	Professional competence	Mastery of subject matter and innovative teaching strategies	Teachers effectively facilitate deep learning
	Reflective competence	Continuous reflection on teaching practices	Continuous improvement of learning quality
Integration of All Aspects	Alignment of objectives, processes, and assessment	Synchronization of learning objectives, instructional strategies, and assessment systems	Consistent implementation of deep learning and character education
	Supportive school culture	Teacher collaboration, school leadership, and policy support	High-quality learning is achieved systematically

The conceptual framework table shows that implementing deep learning–based instruction cannot be separated from strengthening students' character and enhancing teachers' competence. These three elements are interconnected and form a unified learning system, holistically oriented toward the quality of both the learning process and its outcomes. Deep learning serves as the pedagogical approach, character strengthening as the set of values internalized during the learning process, and teacher competence as the key factor ensuring the sustainability and effectiveness of its implementation. This conceptual framework subsequently serves as the basis for analyzing the transformation of teachers' roles and the challenges of implementing deep learning–based instruction integrated with character strengthening.

3.2 Discussion

a) Quality Learning in Primary Education

Quality learning in primary education is a planned process aimed at holistically developing students' potential, encompassing the cognitive, affective, and psychomotor domains. This process is not solely focused on achieving final learning outcomes but emphasizes the meaningfulness of students' learning experiences. In practice, learning should be aligned with the developmental characteristics of primary school students, who are still in the concrete operational stage. Therefore, the approaches employed must be contextual, applicable, and relevant to everyday life (Susanto et al., 2024). In this way, students not only understand the content theoretically but also relate it to real-life experiences and apply it in different situations.

In achieving quality learning, teachers hold a highly strategic role as designers, managers, and facilitators of the learning process. Teachers are required to possess adequate pedagogical competence to design student-centred learning, select diverse methods and strategies, and create interactive, dialogic, and inclusive learning environments (Mezirow, 1991). In addition, teachers must be able to provide constructive feedback and conduct authentic assessments that evaluate not only outcomes but also the learning process and students' ongoing development. The teacher's role in managing classroom dynamics and building positive pedagogical relationships is a crucial factor in creating meaningful learning experiences (Schön, 1983).

Quality education is an empowering process that enables students to develop their full potential. Through meaningful learning, students are encouraged to become independent, critical individuals capable of making responsible decisions (Gusfian et al., 2025). In this context, education functions not only as a means of knowledge transfer but also as a vehicle for character formation, including values such as honesty, responsibility, discipline, and social awareness (Kardinus, 2022). Therefore, integrating moral values into every learning process is an inseparable component of efforts to improve educational quality, particularly at the primary level, which is a critical phase in personality development.

In line with this, the role of teachers is no longer limited to delivering content. However, it extends to acting as motivators, facilitators, and key drivers in creating participatory and reflective learning experiences. Teachers need to encourage active student engagement through discussions, exploration, and collaborative activities that enable learners to construct knowledge independently (Syafila & A'yun, 2024). To support this, learning approaches are required that foster deep understanding while simultaneously integrating cognitive and character dimensions. The deep learning approach is particularly relevant, as it emphasizes not only mastery of concepts but also the ability to connect knowledge, reflect on experiences, and internalize values throughout the learning process (Dewi et al., 2025).

The quality of education can be understood as a system consisting of five interrelated components: student characteristics, learning environment, learning content, learning process, and learning outcomes. These components

form an integrated whole, where each plays a crucial role in determining educational success. Student readiness, supported by health, nutrition, and a conducive family environment, serves as the foundation for learning. A safe and inclusive learning environment, supported by adequate facilities, strengthens the learning process. Furthermore, a relevant curriculum must be implemented through effective instructional practices supported by teacher professsionalism. Ultimately, the quality of education is measured not only by academic achievement but also by character development and students' readiness to face real-life challenges. Therefore, efforts to improve educational quality must be carried out comprehensively, systematically, and sustainably, with attention to the integration of all these components.

b) Deep Learning in Education

Deep learning in education is an instructional approach that emphasises deep cognitive engagement, strong conceptual understanding, and students' ability to connect knowledge with real-life contexts. Unlike its use in artificial intelligence, which focuses on technology and data processing, deep learning in education prioritises students' thinking processes in constructing meaning. This approach promotes a shift from memorisation-oriented learning to meaningful, reflective, and sustainable learning. Thus, students are not only able to acquire information but also to understand, interpret, and apply it in various life situations.

The concept of deep learning is rooted in the work of Marton and Säljö, who distinguish between surface learning and deep learning approaches (Haq & Prasetiyo, 2025). In a deep learning approach, students actively seek to understand the material they are studying, connect new concepts to their existing knowledge structures, and reflect on their learning processes (Santiani, 2025). This approach positions students as active agents in constructing knowledge rather than passive recipients of information. Consequently, learning goes beyond the acquisition of facts and fosters deeper, integrated, and meaningful understanding over the long term.

The successful implementation of deep learning is highly dependent on instructional design that aligns learning objectives, processes, and assessments, as emphasised by the concept of constructive alignment (Mulyanto et al., 2025). Teachers need to design learning experiences that encourage active student engagement in higher-order thinking processes, such as analysing, evaluating, and creating, as highlighted in the revised Bloom's Taxonomy. Through well-structured, systematic instructional design, students are encouraged not only to memorise information but also to develop reasoning skills, problem-solving abilities, and independent knowledge construction (Ilma et al., 2025). This makes the learning process more meaningful and more focused on developing students' intellectual capacities.

In the context of primary education, deep learning is highly relevant because it contributes not only to cognitive development but also to the formation of students' character and reflective attitudes (Della et al., 2025). Learning is designed to enable students to understand, interpret, and relate knowledge to their everyday experiences. Through contextual and participatory approaches, students are encouraged to develop curiosity, independence, and responsibility in learning (Sinulingga et al., 2025). Thus, deep learning not only leads to academic achievement but also supports the holistic development of students' personalities.

Implementing deep learning requires a shift in teachers' roles, from being the primary source of information to becoming facilitators and guides in the learning process. Teachers are expected to design challenging, contextual, and reflective learning experiences and to conduct holistic assessments of learning. Furthermore, the development of teachers' professional competence is a critical factor in supporting the successful implementation of this approach, whether through training, collaboration, or instructional innovation. Educational policy support also plays a strategic role in strengthening the implementation of deep learning, thereby promoting high-quality, character-based, and sustainable learning in primary education.

c) Implementation of Deep Learning in Primary Education

Implementing deep learning in primary education requires careful, systematic, and sustainable planning to ensure learning objectives are achieved optimally. This approach cannot be implemented immediately, as it requires a shift from memorisation-oriented to meaningful, reflective learning. Therefore, its implementation must be tailored to the actual conditions in educational settings, including student readiness, teacher competence, and support for the learning environment. In this context, teachers play a central role as key actors who translate the concept of deep learning into classroom practice through structured planning, appropriate strategies, and effective classroom management (Trisanani et al., 2025).

The implementation of deep learning begins with a socialisation stage involving all educational stakeholders, such as teachers, educational staff, and school management. This stage aims to establish a shared understanding of the concept, objectives, and benefits of deep learning, while also fostering collective commitment to pedagogical

change. Subsequently, a needs analysis and resource readiness mapping are conducted, covering aspects such as teacher competence, availability of facilities and infrastructure, and student characteristics. The results of this analysis serve as the basis for designing contextual and realistic implementation strategies aligned with school conditions.

The next stage involves limited pilot implementation within actual classroom settings. This trial aims to provide an initial overview of the effectiveness of deep learning implementation, including its strengths and challenges during the learning process. The results of this pilot are then analysed to generate preliminary recommendations for refining instructional design. This process demonstrates that implementing deep learning is dynamic and continuous, requiring conceptual readiness, pedagogical skills, and teachers' reflective capacity to develop more effective instructional practices.

Evaluation is a crucial component throughout the implementation process, as it serves as the basis for continuous improvement. Through evaluation, teachers can assess the extent to which learning objectives are achieved, the level of student engagement in the learning process, and the effectiveness of the strategies employed. The findings from this evaluation are then used to inform revisions and adjustments in the implementation of deep learning to better respond to students' needs. After refinement, the approach can be implemented more broadly, with indicators of success including improvements in the quality of both learning processes and outcomes, as well as the development of students' critical and reflective thinking skills.

At the primary education level, the implementation of deep learning is directed toward the balanced development of students' knowledge, skills, and attitudes as an integrated whole. Learning is designed not only to transfer knowledge but also to train students in independent learning (learning how to learn), develop critical thinking skills, and solve real-life problems. In this regard, teachers need to ensure alignment among learning objectives, instructional processes, and assessment practices. Consequently, students' learning experiences contribute not only to academic achievement but also to character development, reflective attitudes, and their readiness to face challenges at subsequent levels of education.

d) Character Strengthening in Deep Learning–Based Instruction

Character strengthening is a fundamental objective in primary education, as this stage represents a critical period during which students' values, attitudes, and learning habits are systematically and continuously developed. Deep learning–based instruction is closely related to this effort because it not only focuses on knowledge acquisition but also emphasizes students' active engagement in reflective thinking, problem-solving, and responsible decision-making (Assidiqi & Sadiyah, 2025). Through meaningfully designed learning experiences, students are encouraged to understand not only what they learn but also how and why they learn. This process fosters deeper learning awareness while simultaneously cultivating positive attitudes that form an essential part of students' character.

Character strengthening in deep learning is also supported by national education policies that emphasize the importance of internalizing character values as part of educational goals (Mardatillah et al., 2025). Values such as religiosity, honesty, responsibility, discipline, cooperation, and social awareness are not only taught explicitly but must also be integrated into everyday learning processes. In this context, learning serves as a strategic means of embedding these values through structured, meaningful activities (Tuharea & Abdin, 2021). Thus, character education does not function as a separate program but becomes an integral part of the learning process students experience directly.

The deep learning approach enables character development to be carried out in an integrated manner through contextual, collaborative, and reflective learning experiences (Nabila et al., 2025). Students are engaged in various activities that require them to think critically, participate in discussions, collaborate with peers, and connect learning materials with real-life situations (Riska & Puspita, 2025). Through this active involvement, students not only acquire knowledge but also learn to respect others' perspectives, develop empathy, and take responsibility for completing tasks. This process positions learning as an effective space for the natural, continuous internalization of character values.

Furthermore, deep learning–based instruction provides ample opportunities for reflective practices as a key component of character strengthening. Reflective activities allow students to evaluate their learning experiences, understand the processes they have undergone, and identify their strengths and weaknesses (Wiyogo et al., 2025). Through guided reflection, students are trained to be honest with themselves, develop self-awareness, and cultivate responsibility for their own learning progress (Nurvayanti et al., 2025). This reflective process not only enhances cognitive understanding but also fosters critical thinking and independent learning attitudes. Therefore, character strengthening within deep learning cannot be separated from the role of teachers as instructional designers and facilitators. Teachers are responsible for creating learning experiences that are not only intellectually challenging

but also rich in character values. Through integrative instructional design, teachers can guide students to develop conceptual understanding while simultaneously fostering positive attitudes and behaviours. The integration of cognitive, affective, and reflective dimensions in deep learning makes this approach a strong foundation for holistically and sustainably developing students' character, as well as preparing them to face future life challenges.

e) The Role of Deep Learning and Character Strengthening in Enhancing Teacher Competence

The integration of deep learning–based instruction with character strengthening not only positively impacts student development but also significantly enhances teacher competence. This approach requires a transformation in the teacher's role, from merely delivering content to becoming a strategic instructional designer, an active facilitator of the learning process, and a reflective practitioner who continuously evaluates pedagogical practices. Teachers are no longer focused solely on transmitting information but on creating meaningful, challenging, and contextual learning experiences. In this process, teachers are expected to design instruction that promotes students' cognitive engagement, manage dynamic learning interactions, and engage in continuous critical reflection to improve the quality of learning continuously.

This strengthening of the teacher's role aligns with the framework of teacher competence, which includes pedagogical, professional, personal, and social competencies that are integratively interconnected. These four competencies serve as the foundation for implementing deep learning–based instruction integrated with character strengthening. Teachers are required not only to master subject content deeply but also to build positive educational relationships, serve as role models in embodying character values, and interact effectively with students and the broader social environment. The integration of content mastery, pedagogical ability, and personal qualities positions teachers not only as instructors but also as educators who guide students' holistic development (Ibrahim, 2024).

From a pedagogical perspective, the deep learning approach encourages teachers to develop the ability to design student-centred, contextually relevant, and challenging learning experiences (Maulidya et al., 2025). Teachers need to understand students' characteristics, needs, and learning styles, and be able to implement problem-based, project-based, and inquiry-based learning strategies. In addition, teachers are required to integrate authentic assessment practices that evaluate not only learning outcomes but also students' thinking processes and development. The ability to reflect on instructional practices becomes a critical aspect of strengthening pedagogical competence, as reflection enables teachers to identify strengths and weaknesses and make continuous improvements to enhance instructional effectiveness (Lestari, 2024).

In terms of professional competence, the implementation of deep learning encourages teachers to continuously deepen their mastery of subject matter and their ability to connect it with various real-life contexts (Wafa et al., 2025). Teachers are expected to facilitate meaningful discussions, design challenging learning activities, and guide students in solving authentic problems relevant to their lives. Furthermore, integrating character strengthening into instruction helps shape teachers' professional ethos, including responsibility, honesty, discipline, and a commitment to instructional quality. This indicates that teacher professionalism is determined not only by academic content mastery but also by moral integrity and consistency in fulfilling their role as educators.

Meanwhile, teachers' personal and social competencies are also strengthened through the implementation of deep learning–based instruction. Reflective practices, which are integral to this approach, encourage teachers to develop self-awareness, openness to feedback and criticism, and a commitment to continuous learning and adaptation to change. On the other hand, collaborative interactions within the learning process encourage teachers to build effective communication, foster cooperation, and establish positive interpersonal relationships with students, fellow teachers, and the educational community. Overall, the integration of deep learning and character strengthening plays a significant role in transforming teachers into adaptive, reflective, and innovative individuals, while also reinforcing their position as agents of change in sustainably improving the quality of education.

f) Challenges and Strategies for Strengthening the Implementation of Deep Learning and Character Strengthening

The implementation of deep learning–based instruction integrated with character strengthening in educational practice continues to face various challenges, both structural and cultural. One of the primary challenges relates to teacher readiness, particularly in terms of conceptual understanding and pedagogical skills required to design learning that emphasises deep understanding and the development of students' character. This readiness includes teachers' ability to align learning objectives, instructional strategies, and assessment practices to support meaningful learning outcomes. On the other hand, many teachers are still accustomed to conventional instructional approaches that emphasise content delivery and procedural achievement of curriculum targets. Such practices tend to limit opportunities for reflection, conceptual exploration, and contextual learning, which are key characteristics of deep

learning (Biggs, 1999). In addition, the heavy administrative workload teachers face, along with limited access to adequate learning facilities and infrastructure, further constrains the optimal implementation of deep learning in educational settings. These conditions have implications for the quality of the learning process, which has not yet fully accommodated students' needs holistically (UNICEF, 2000).

Another challenge in implementing deep learning–based instruction is the school culture and assessment systems that remain predominantly oriented toward cognitive achievement. In practice, character strengthening is often positioned as an additional activity separate from the core learning process, and thus has not been systematically integrated into instructional planning and implementation (Sriwiguna & Nugraha, 2026). This perspective results in character education not being fully embedded in students' learning experiences.

Deep learning requires integrating conceptual mastery, developing higher-order thinking skills, and simultaneously internalising character values. The learning process is not only directed toward academic achievement but also toward the meaningful interpretation of learning experiences that encourage reflection, active engagement, and the development of students' attitudes and values (Marton & Säljö, 1976). A lack of alignment among learning objectives, instructional strategies, and assessment systems may hinder teachers' ability to implement deep learning consistently and sustainably. Therefore, it is necessary to restructure assessment systems and school culture to align with the principles of deep learning and character strengthening as an integrated whole.

To address these challenges, systemic and sustainable implementation strategies are required. One key strategy is strengthening teacher professional development through training programs that focus on reflective practice, contextual instructional design, and the integration of character strengthening across all stages of the learning process. Professional development centred on deep learning enables teachers to continuously enhance their pedagogical capacity and strengthen their ability to facilitate conceptual understanding and character development (Darling-Hammond et al., 2017). Furthermore, teachers need to be encouraged to position themselves as lifelong learners who actively reflect on their instructional practices and adapt them to the needs, characteristics, and learning contexts of their students. Reflective practice serves as a critical foundation for teacher professional growth, enabling continuous improvement through authentic classroom experiences (Schön, 1983). In addition, strengthening professional learning communities can function as a collaborative space for sharing best practices, discussing implementation challenges, and fostering a collective learning culture that supports the consistent and sustainable application of deep learning in schools.

Another equally important strategy is strengthening policy support and school leadership oriented toward instructional innovation. School leadership plays a strategic role in creating an institutional climate that is conducive to the implementation of deep learning–based instruction and character strengthening. School principals, together with educational stakeholders, need to promote alignment among curriculum, assessment systems, and school development programs to support learning practices focused on deep understanding and character formation (Fullan, 2016). Moreover, consistent policy support and collaborative leadership foster a school culture that is open to change and pedagogical innovation. Synergy among stakeholders, both at the school level and within broader policy contexts, is a crucial prerequisite to ensure that the implementation of deep learning integrated with character strengthening does not remain at a conceptual level, but is realised concretely and sustainably in everyday instructional practices.

4. IMPLICATIONS AND CONTRIBUTIONS

4.1 Research Implications

The findings of this study have important implications for primary education practices, particularly in shifting the learning paradigm from memorisation-oriented approaches to deep learning–based instruction that is meaningful and contextual. Teachers need to develop competencies in designing instruction that aligns learning objectives, processes, and assessments, while also integrating character-strengthening into every learning activity. In addition, educational institutions and policymakers need to provide support through continuous professional development, improvement of assessment systems that do not solely emphasise cognitive aspects, and the creation of a school culture that fosters reflective and collaborative learning. Thus, the implementation of deep learning not only improves learning outcomes but also contributes to character development and students' readiness to face future challenges.

4.2 Research Contributions

This study contributes theoretically by presenting an integrative conceptual framework that links deep learning–based instruction, character strengthening, and the enhancement of primary school teacher competence into a unified whole. This study enriches the existing literature by emphasising that these three aspects cannot be separated in efforts to achieve high-quality learning. In addition, this study offers practical contributions as a reference for teachers, researchers, and policymakers in designing and developing learning models that are more holistic, reflective, and sustainable. Therefore, the findings of this study can serve as a foundation for developing instructional innovations that address the demands of 21st-century education.

5. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

5.1 *Research Limitataions*

This study has limitations due to its use of a library research approach that focuses on conceptual analysis and does not involve direct empirical data from classroom practices. As a result, the findings are primarily theoretical and may not fully capture the dynamics of implementing deep learning and character strengthening in real primary school contexts. In addition, the scope of the study is limited by the availability and relevance of the literature sources used, which may mean that other perspectives or research findings have not been fully incorporated. Therefore, the generalisation of these findings should be undertaken cautiously, taking into account varying contexts and conditions.

5.2 *Recommendation for Future Risearch Direction*

Future studies are recommended to develop empirical investigations using qualitative field approaches, quantitative methods, or mixed methods to directly examine the implementation of deep learning–based instruction and character strengthening in primary education. Further research should also explore applicable instructional models and designs, including the development of learning materials, the use of authentic assessment strategies, and the integration of technology to support deep learning. In addition, it is important to examine more specifically the relationship between deep learning implementation and teacher competence enhancement across different educational contexts to obtain a more comprehensive, context-specific understanding. Thus, future research is expected to strengthen theoretical findings while also providing more concrete practical contributions to improving the quality of learning in primary education.

6. CONCLUSIONS

Quality learning in primary education fundamentally requires integrating knowledge mastery, skill development, and balanced character formation. Based on the conceptual analysis, deep learning–based instruction holds a strategic position in achieving this quality, as it emphasises meaningful conceptual understanding, active student engagement, and the connection of knowledge to real-life contexts. Through this approach, the learning process extends beyond short-term academic achievement and is directed toward the development of reflective thinking and sustainable learning attitudes.

This study demonstrates that integrating deep learning with character strengthening has direct implications for enhancing primary school teachers' competence. Teachers are required to develop pedagogical competence in designing contextual, student-centred learning; professional competence in mastering subject content and its real-life relevance; and personal and social competencies through reflective practice, role modelling, and humanistic pedagogical interactions. Thus, deep learning functions as a pedagogical approach that promotes the transformation of teachers' roles from conventional instructors to adaptive facilitators and instructional designers.

However, implementing deep learning–based instruction integrated with character strengthening still faces various challenges at the individual teacher level, within school institutional culture, and across the broader education system. These challenges require sustainable strengthening strategies, including continuous professional development for teachers, fostering a school culture that supports meaningful learning, and aligning with supportive educational policies.

This study confirms that deep learning–based instruction plays a strategic role in improving the quality of learning processes while simultaneously strengthening character education in primary education. The integration of these approaches directly contributes to the development of teacher competence, particularly in pedagogical, professional, personal, and social domains through reflective practice and meaningful instructional design.

Therefore, this study offers a theoretical contribution in the form of an integrative conceptual framework that links deep learning, character strengthening, and the enhancement of primary school teacher competence.

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Author Contribution Statement

The author declares that the entire research and writing process for this article was conducted independently. The author assumes full responsibility for all data associated with this research. No other individual contributed as a co-author or made any significant contribution to the content of this work.

Declaration of Generative AI (GenAI) Usage in Scientific Writing

The authors declare that the use of artificial intelligence (AI) technology in the preparation of this article was limited to assisting with language editing and improving the clarity of the writing structure. All ideas, analyses, interpretations, and conclusions presented in this article are entirely the result of the authors' own intellectual work and responsibility. The authors confirm that AI was not used to replace intellectual contributions in the scientific process. All instances of Generative AI usage in this article were conducted by the authors in accordance with the IJCES GenAI Tool Usage Policy, with the authors assuming full responsibility for the originality, accuracy, and integrity of the work."

Conflict of Interest Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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