



Leading the Future: Transformational Leadership in the Age of Deep Learning

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Abstract. The transformation of 21st-century education requires school leaders to adopt responsive, innovative, and contextually relevant leadership models. This study examines how principals implement transformational leadership to support deep learning in junior high schools in Banyumas Regency, Indonesia. Drawing on Bass and Avolio's framework and social constructivist learning theory, this research is exploratory qualitative case study design. Semi-structured interview, participant observation, and document analysis were used to collect data. Ten informants from four public and private schools implementing the Merdeka Curriculum participated in the study. Thematic analysis produced three key themes: strengthening a shared vision for 21st-century learning, empowering teachers through reflective and collaborative practices, and addressing structural and cultural barriers that limit innovation. The findings indicate that transformational leadership substantially contributes to building a school culture that supports deep learning, particularly through shared vision formation and continuous teacher mentoring. This study is significant because it contextualizes transformational leadership within rural Indonesian schools, addressing a gap in the literature that is dominated by quantitative studies and urban contexts. Practically, the study provides insights for principals, policymakers, and teacher development programs to enhance pedagogical transformation.

Keywords: Deep Learning in Education, Kurikulum Merdeka, Qualitative Case Study, School Leadership, Transformational Leadership.

1 Introduction

The rapid changes in the realm of technology, information, and communication have put great pressure on the education system to carry out fundamental transformation. In this context, transformative leadership styles are emerging as a relevant strategic approach in responding to the challenges of the 21st century [1], [2]. Transformative leadership is believed to be able to form an inspiring work climate, improve teacher performance, and facilitate a meaningful learning innovation process [3], [4]. On the other

hand, the deep learning paradigm in learning prioritizes the active involvement of students in building conceptual understanding, thinking at a higher level (HOTS), and applying knowledge in a real context [5], [6]. This model not only demands changes in learning methods, but also requires school leaders who are able to orchestrate systemic school culture change [7], [8]. Transformational leaders play a key role in creating a learning environment conducive to deep learning, especially through teacher empowerment, structural flexibility, and strategic use of digital technology [9], [10].

The context of Indonesia, and especially Banyumas Regency, shows interesting dynamics. Although the discourse on deep learning-based learning transformation has been adopted nationally through policies such as Merdeka Belajar, its implementation in the field still faces structural and cultural challenges [11], [12]. Many principals have not fully adopted the role of agents of change, while the quality of learning and teacher competence still show disparities between schools [13], [14]. Empirical evidence from preceding studies suggests that transformative leadership serves as a key determinant in fostering teacher performance and overall school achievement [15], [16]. Nevertheless, although various international studies have shown that transformational leadership styles are effective in driving pedagogical change and strengthening 21st century learning [7], [17], contextual research in Indonesia, especially those that use qualitative approach to explore the experiences of school heads in non-metropolitan areas such as Banyumas Regency, is still relatively limited [11], [13].

Most studies in Indonesia still focus on the quantitative approach or administrative aspects of school leadership [4], [16], so that it has not fully captured the socio-cultural dynamics and leadership practices in the local context. In fact, deep learning requires an ecosystem that supports teacher collaboration, formative evaluation, and cross-disciplinary learning that can only be made possible through a participatory and visionary leadership style [7], [8]. The theoretical underpinning of this study rests on Bass and Avolio's transformational leadership construct, which comprises idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. These dimensions are recognized as instrumental in advancing teacher professional development and nurturing an innovative school climate. Accordingly, the present study contributes to bridging the identified gap in scholarly discourse while yielding practical insights for elevating the quality of transformation-based learning at the elementary and secondary school levels [1], [18]. In the approach to education based on social constructivism, the role of leaders as facilitators and spaces for collaboration is crucial [18], [19].

The uniqueness of this study lies in an in-depth exploration of how school principals in Banyumas interpret and carry out transformational leadership roles in encouraging the implementation of deep learning in schools. The study also documented the social, cultural, and structural challenges that influenced the change process. Emphasizing exploratory and contextual approaches, this research makes a theoretical contribution to the development of transformative leadership models based on local needs as well as practical contributions to education policy-making at the regional level. This research aims to explore how transformative leadership models are applied in supporting the implementation of deep learning learning in Banyumas Regency schools, as well as

identify effective practices and leadership challenges faced in the learning transformation process.

1.1 Transformative Leadership in Education

Rooted in Burns' foundational scholarship of 1978 and further elaborated by Bass and Avolio in 2003, transformational leadership represents a distinctive style that empowers individuals by fostering a sense of shared purpose, unified goals, and collective vision. This model is known for its four main components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration [1], [4]. In the educational context, principals with this style create a positive work climate, increase teacher enthusiasm, and encourage collaboration in improving learning [3], [16]. They act as agents of change who build an adaptive, reflective, and innovative school culture [9], [15]. Research shows that transformational leadership can increase job satisfaction, organizational commitment, and teacher effectiveness in implementing meaningful learning [10], [16]. Amid digital disruption, the role of transformational leaders is increasingly crucial in directing educational change towards a future-oriented learning vision [11], [13].

1.2 Deep Learning in Education

Deep learning is a learning approach that emphasizes active student involvement in understanding concepts deeply, thinking critically, and linking knowledge to real contexts [5], [18]. Based on social constructivism, this approach positions students as active subjects through interaction, reflection, and exploration [6], [20]. Deep learning focuses on developing the 4C skills, namely critical thinking, creativity, collaboration, and communication, and encourages a shift from content-based learning to process- and competency-based learning [7], [8]. In Indonesia, this concept was introduced through the Independent Curriculum which encourages cross-disciplinary project-based contextual learning [19], [21]. Despite its theoretical strengths, the practical adoption of transformational leadership remains constrained by a range of structural and cultural impediments, among them resource limitations, organizational resistance, and the entrenched dominance of conventional leadership paradigms [12], [14]. In this condition, the role of school leaders is crucial in creating a learning ecosystem that supports sustainable pedagogical transformation.

1.3 The Relationship Between Transformative Leadership and Deep Learning

Research shows a strict correlation between transformational leadership and the effectiveness of deep learning-based instructional implementation. Sliwka et al. (2024) emphasize that transformational leaders not only drive instructional change but also break down the boundaries of traditional education systems through teacher collaboration, the desire for learning space and time, and authentic assessment [2], [8]. However, challenges such as limited resources, cultural resistance to innovation, and the dominance of administrative leadership styles remain major challenges [11], [12]. Therefore, a

leadership model that prioritizes collective vision, active participation, and trust in teacher capacity is needed [4], [14]. Although the strategic role of transformational leadership has been widely discussed in global literature [7], [17], the local context of Indonesia, especially in areas such as Banyumas Regency, has rarely been studied qualitatively. Existing studies are mostly quantitative and have not explored the processes, meanings, and accompanying socio-cultural dynamics [4], [16]. This indicates the need for in-depth contextual research on transformational leadership practices in encouraging deep learning-based instruction in various school environments.

2 Methods

Employing a qualitative approach, this research adopts an exploratory case study design to comprehensively investigate how school principals in Banyumas Regency exercise transformational leadership in advancing deep learning at the junior high school level. This methodological choice reflects the design's recognized strength in exploring multifaceted and context-specific phenomena from the standpoint of those directly involved [22]. The research location was Banyumas Regency, Central Java, with diverse socio-cultural characteristics. A purposive sampling technique was used with the following criteria: principals with at least three years of service, schools actively implementing the Independent Curriculum and project-based learning, and having innovative programs involving teachers in curriculum development.

Four schools were selected as case studies: SMP Negeri 2 Purwokerto, SMP Negeri 1 Baturraden, SMP IT Al-Irsyad Purwokerto, and SMP Muhammadiyah Ajibarang. Ten participants, consisting of four principals, four senior curriculum coordinators, and two vice principals for academic affairs, were interviewed in-depth.

The data collection process is carried out through three integrated approaches. Insights into the experiences, strategies, and perceptions of school principals and teachers concerning leadership and deep learning are gathered via semi-structured interviews. Participatory observation is selectively applied to routine institutional activities, namely curriculum development meetings, classroom supervision, and project-based learning. Complementing these, document analysis encompasses a review of school vision and mission statements, annual work plans, and documentation of learning activities aligned with the Independent Curriculum. Data were analyzed using a thematic analysis approach based on the Braun and Clarke (2006) model, through six stages: Transcription and reading of the data thoroughly, Initial coding of meaningful data parts, Identification of potential themes, Review and grouping of themes, Naming and definition of the final theme, Compilation of the narrative of the findings.

The analysis was carried out in a reflective and cyclical manner to capture the depth of meaning of the participants' experiences. Data Validity and Credibility; to ensure trustworthiness, techniques are used: Triangulation of data sources (interviews, observations, documents), Member checking (confirmation of findings to participants), Peer debriefing with peers to review the clarity and consistency of the analysis, Audit trail by documenting the entire analysis process systematically. This study was conducted with informal consent from the school and written consent from participants (informed

consent). The identities of the school and participants are disguised in order to maintain the confidentiality and ethics of the research.

3 Results and Discussion

3.1 Results

The results of data analysis from four junior high schools (SMP) in Banyumas Regency show that there is a transformative leadership dynamic of school principals in supporting the implementation of deep learning learning. Through the process of interviews, observations, and document analysis, three main themes were obtained, namely: (1) Strengthening the Shared Vision for 21st Century Learning, (2) Teacher Empowerment in Creating Meaningful Learning, and (3) Structural and Cultural Challenges in Transformative Leadership Practices.

Strengthening a Shared Vision for 21st Century Learning

Principals play a central role in building a collective vision of the school that supports a 21st-century approach to learning. In the four schools studied, the principal showed a strong commitment in socializing the importance of a paradigm shift from teacher-centered learning to competency-based learning and real context.

"We started from changing the mindset first, that the teacher's job is not only to convey, but to shape the child's mindset. We have emphasized this since the beginning of the school year."

(Principal, SMP Negeri 2 Purwokerto)

This vision becomes the foundation for various internal school policies, including project-based learning integration, cross-subject collaboration, and reflection-based formative evaluation. The indicators and supporting evidence of strengthening a shared vision for 21st-century learning are presented in Table 1. This shows the real practice of the element of inspirational motivation in transformative leadership theory [1]. This emphasis on a shared vision is also in line with the findings of Sliwka et al. (2024), who stated that successful leaders in driving deep learning are those who are able to make innovation part of school culture, not just a momentary project. In addition, the compatibility between the vision of the principal and the direction of national policies such as the Independent Curriculum is a strengthening factor in the school transformation process [8].

Table 1. Indicators and evidence of strengthening a shared vision

Indicator	Description	Supporting Evidence
Mindset Shift	Principals promote a paradigm shift from teacher-centered to competency-based learning.	"Changing the mindset... the teacher's job is to shape the child's thinking." – Principal, SMP N 2 Purwokerto
Project Integration	Vision supports integration of project-based and contextual learning.	Observed in PjBL activities and curriculum documents.

Indicator	Description	Supporting Evidence
Cross-Subject Collaboration	Leaders encourage collaboration among teachers across subjects.	Mentioned in interviews; consistent with TL theory.
Reflection-Based Evaluation	Emphasis on formative, reflective learning assessments.	Supported by internal policy documents.
Alignment with National Policy	School vision aligns with the Merdeka Curriculum policy direction.	Reflected in curriculum implementation documents and interview findings.

Empowering Teachers in Creating Meaningful Learning

The second theme that emerged was how school principals empower teachers as agents of change in learning. This empowerment is carried out through providing space for pedagogical exploration, reflective mentoring, and recognition of teachers' initiatives. The teacher empowerment practices identified in this study are summarized in Table 2. The principal is also active in creating a regular reflection forum between teachers to share good practices with each other.

"We do not just give tasks to teachers, but we accompany them. There are small trainings every month, and every weekend there are sharing sessions. We create a learning community so that teachers feel developed."

(Vice Principal, Al-Azhar Banyumas IT Junior High School)

This practice reflects two important aspects of transformational leadership, namely intellectual stimulation and individualized consideration, where leaders encourage teachers' professional growth and support the diversity of their learning styles and experiences [9], [17]. In the context of deep learning, teacher empowerment is the main key because this learning model demands the active role of teachers in designing challenging, interactive, and contextual activities [5], [20]. Research by Supovitz et al. (2010) confirms that when teachers feel autonomous and professionally supported, they are more open to complex innovative practices.

Table 2. Practices and evidence of teacher empowerment

Practice	Description	Supporting Evidence
Reflective Mentoring	Principals accompany teachers through regular guidance and reflective sessions.	"We accompany teachers... small trainings every month." Vice Principal, Al-Azhar IT JHS
Sharing Sessions	Weekly forums for exchanging best practices and collaborative learning.	"Every weekend there are sharing sessions." – Vice Principal
Pedagogical Exploration	Teachers encouraged to design contextual, interactive, and challenging learning.	Linked to intellectual stimulation component of TL.

Practice	Description	Supporting Evidence
Recognition of Teacher Initiative	Leaders appreciate and support teacher creativity and innovation.	Confirmed in interview narratives.
Professional Autonomy	Teachers given freedom to try new instructional strategies.	Supported by research (Supovitz et al., 2010).

Structural and Cultural Challenges in Leadership Practice

Although the commitment to transformation is relatively strong, principals and teachers still face various structural and cultural challenges. The major challenges identified during the implementation process are presented in Table 3. These challenges include limited digital facilities, high administrative burden, lack of ongoing curriculum training, and resistance of some teachers to new approaches.

"We want to change, but the reality is sometimes not supportive. The internet network is weak, some teachers are afraid to try new things. Not to mention the time of the administration."

(Senior Teacher, Muhammadiyah Ajibarang Junior High School).

This indicates that change requires not only strong leadership, but also systemic support from outside the school. This finding is consistent with the research of Wahyudi et al. (2025) which states that one of the main obstacles to the implementation of the Independent Curriculum is the lack of a stable support system in the regions. Faced with this, school principals are required not only to be technical managers, but also moral leaders who build collective resilience and foster a culture of adaptive learning [11], [16]. Transformation will only succeed if it is accompanied by cultural change and deep emotional support for teachers.

Table 3. Types of structural and cultural challenges identified

Challenge Type	Description	Participant Evidence
Digital & Infrastructure Problems	Limited internet access and insufficient digital equipment.	"The internet network is weak..." – Teacher, Muhammadiyah Ajibarang
Administrative Burden	Excessive paperwork reduces teacher focus on innovation.	Reported across schools.
Limited Training Support	Lack of continuous curriculum and pedagogical training.	Consistent with Wahyudi et al. (2025).
Resistance to Change	Some teachers fear or resist new teaching approaches.	"Some teachers are afraid to try new things." – Teacher
Need for Emotional & Cultural Support	Leadership must strengthen collective resilience and adaptive school culture.	In line with TL theory.

3.2 Discussion

This study enriches scholarly understanding of transformational leadership as it is practiced within the distinctive context of Indonesian junior high schools, with particular attention to institutions located in rural and semi-urban regions, as exemplified by Banyumas Regency. The findings strengthen existing theories suggesting that transformational leadership is a key foundation for building learning environments aligned with 21st-century demands, including deep learning. While previous research [7] has emphasized the importance of vision and teacher collaboration, most of these studies rely on large-scale surveys or focus on high-performing schools in urban settings. By adopting a qualitative, context-sensitive lens, this study illuminates granular leadership behaviors such as structured mentoring, reflective dialogue sessions, and culturally embedded meaning-making processes, dimensions that tend to remain obscured within the confines of quantitative research paradigms, thus making a meaningful contribution to the scholarly discourse.

The data indicate that principals in Banyumas enact transformational leadership not only through formal policy direction but also through day-to-day relational work that builds trust, shared purpose, and emotional safety for teachers. This finding resonates with Hallinger's [23] argument that leadership influence is mediated by the social fabric of the school rather than solely by administrative directives. The frequency with which participants described mindset change, teacher reflection, and shared professional learning communities shows that deep learning does not occur spontaneously; it emerges from continuous leadership-driven efforts to reorganize teacher beliefs and instructional routines. In this sense, the data "speak" to the importance of leadership presence, consistency, and emotional labor in guiding pedagogical transformation.

At the same time, the results demonstrate that transformational leadership alone is insufficient to ensure successful deep learning implementation. Structural challenges such as limited digital infrastructure, administrative workload, and uneven teacher readiness create friction that restricts the speed and depth of innovation. This supports findings from Wahyudi et al. [24] and OECD [5], which argue that leadership effectiveness depends on alignment between school-level initiatives and system-level support. The combination of strong principal vision and systemic constraints in this study reflects the complex interplay between leadership, resources, and policy implementation in developing regions. Collectively, these findings position this study as a bridge between global theories of transformational leadership and their grounded application in rural Indonesian contexts. By highlighting how principals translate abstract leadership ideals into practical routines while simultaneously navigating cultural and structural barriers this research adds texture to the literature and provides an alternative narrative to studies conducted in more resource-rich environments.

Limitations

Despite its contributions, this study has several limitations. First, the research focuses on four schools within a single regency, which limits the generalizability of findings to broader national contexts with different socioeconomic characteristics. Second,

data rely heavily on interviews and observations, which may capture participants' perspectives but not fully represent long-term leadership impact or student-level outcomes. Third, the study centers on the principal's role, while future research could explore how leadership is distributed among vice principals, senior teachers, and curriculum teams. Finally, because the qualitative design emphasizes depth over breadth, the frequency charts and thematic tables illustrate relative emphasis rather than statistical measurement. Future studies could integrate mixed-method approaches to examine how transformational leadership interacts with teacher capacity-building, school infrastructure, and policy implementation at a systemic level.

4 Conclusion

Drawing on an exploratory qualitative framework, this study concludes that the transformational leadership of school principals is instrumental in fostering the implementation of deep learning at the junior high school level across Banyumas Regency. The evidence suggests that principals operate not merely as administrative figures, but as catalysts of institutional change, championing a collective vision of 21st century learning, cultivating teacher empowerment, and persistently confronting the multifaceted structural and cultural obstacles present within their school environments. The principal in this context shows the capacity for inspirational motivation by uniting all school residents on progressive common values and goals. They also provide intellectual stimulation to teachers through learning communities, reflective training, and support for pedagogical experiments that are in line with the spirit of the Independent Curriculum. However, challenges such as limited resources, resistance to change, and high administrative burden are still obstacles to the optimal implementation of deep learning at the education unit level.

These findings make a theoretical contribution by enriching the literature on transformational leadership in education, particularly through contextual perspectives in non-metropolitan areas of Indonesia. This research shows that such leadership models are not only relevant in an advanced educational environment, but can also be a practical strategic approach in local contexts with limited resources. Practically, the results of this study provide implications for school principals to strengthen leadership capacity based on vision, collaboration, and reflection. For teachers, the importance of support for community-based professional development is an important note in order to be able to implement meaningful learning independently and creatively. Meanwhile, for education policymakers, systemic efforts are needed to create an environment conducive to the growth of learning innovation in schools, through reducing administrative burdens, providing contextual training, and supporting equitable digital infrastructure. Although this study provides important insights, the limitations of the study in terms of the number of locations and coverage of participants suggest the need for follow-up research with a wider and more diverse reach. Further studies can explore how transformational leadership dynamics develop within different levels of education or through a longitudinal approach to see change on an ongoing basis. Thus, the transformation of education based on deep learning and reflective leadership can continue to

be strengthened to answer the challenges and opportunities of Indonesian education in the future.

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