

Social interaction between principals and teachers in urban and rural schools and the influence on generation Alpha's learning engagement: A comparative thematic study

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Abstract: This study examines how social interactions between principals and teachers in urban and rural schools influence the learning engagement of Generation Alpha students and how these dynamics support equitable, technology-enabled learning aligned with Sustainable Development Goals (SDGs). A systematic literature review and bibliometric analysis were conducted using the Dimensions database (2020–2025), following PRISMA procedures to identify studies on leadership collaboration, contextual school differences, and student engagement. VOSviewer was used to map keyword networks and thematic patterns. The findings show a steady increase in publications and citations, indicating rising scholarly interest in principal–teacher collaboration. Such interactions enhance teacher motivation, strengthen school climate, and encourage digital and student-centered pedagogies suited to Generation Alpha. Urban schools generally depend on structured systems and technology-supported communication, while rural schools emphasize relational trust and community-based leadership. Despite these differences, both contexts highlight the importance of adaptive collaboration in promoting engagement and reducing disparities. Effective principal–teacher interaction supports digital integration, relational trust, and inclusive practices, linking classroom-level improvements with broader systemic reforms that advance SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 17 (Partnerships). The study recommends context-sensitive leadership, strategic use of digital tools, and stronger professional learning communities to improve engagement across school settings.

Keywords: *Generation Alpha, Principal-teacher interaction, Rural schools, Student engagement, Sustainable development goals (SDGs), Urban schools.*

1. Introduction

The interaction between school principals and teachers is a cornerstone of creating a conducive and effective learning environment. These interactions are particularly crucial for fostering student engagement, especially among Generation Alpha, children born from the mid-2010s to the mid-2020s, who are digital natives and exhibit distinct learning behaviors compared to previous generations [1, 2]. As educators, principals, and teachers play pivotal roles in shaping the learning climate, research has shown that positive interactions between them are strongly linked to improved student outcomes, higher participation, and enhanced academic achievement [3, 4]. However, despite the growing importance of these relationships, limited studies have specifically explored how these interactions vary between urban and rural settings and how such differences affect the engagement of Generation Alpha students.

The rapid advancement of educational technology presents new opportunities and challenges for both school leaders and teachers. In urban schools, access to digital resources is generally more abundant than in rural schools, leading to differences in how principals and teachers collaborate to

foster a learning environment that supports student engagement [5-7]. Generation Alpha, being the first cohort to grow up fully immersed in digital technology, requires educators to adapt their teaching methods to leverage these technologies effectively. This generation's tech proficiency demands innovative strategies from school leaders, who must cultivate strong teacher-student relationships to ensure that learning remains engaging and effective [8, 9]. The question then arises: how do principal-teacher interactions, shaped by urban and rural contexts, influence the educational engagement of Generation Alpha students?

The urban-rural divide not only affects resource availability but also influences the structure and culture of principal-teacher interactions. Urban schools tend to emphasize systematic, resource-rich environments, supported by advanced technological tools, while rural schools often prioritize community ties, personal relationships, and cultural values. These contextual differences shape leadership styles and collaboration approaches between principals and teachers, which ultimately impact students' learning opportunities and outcomes. Notably, in faith-based schools, the application of transformational leadership, where school leaders inspire and motivate teachers and students, has been shown to significantly enhance student engagement, academic performance, and character development [10]. However, the influence of transformational leadership within different geographical contexts remains underexplored, and further research is needed to understand how leadership approaches in rural and urban settings shape educational outcomes for Generation Alpha.

This study seeks to bridge this gap by examining the social interaction patterns between principals and teachers in urban and rural schools and analyzing how these interactions influence the engagement of Generation Alpha students. Furthermore, this study attempts to answer how leadership collaboration between principals and teachers influences Generation Alpha students' engagement, in what ways urban and rural school contexts shape differences in social interaction between principals and teachers, how these interactions connect with the unique learning characteristics of Generation Alpha, and the contribution principal-teacher interaction can make toward advancing SDG targets in education.

2. Methods

This study used a systematic literature review combined with bibliometric analysis to investigate the social interactions between principals and teachers in urban and rural schools. The Dimensions database was selected as the primary source because of its extensive multidisciplinary coverage and robust citation analytics. The search targeted studies published between 2020 and 2025, using keyword combinations such as “*principal-teacher interaction*,” “*school leadership*,” “*teacher collaboration*,” “*urban schools*,” “*rural schools*,” “*Generation Alpha*,” and “*student engagement*.” The initial search produced 634,342 records, and only 96,302 remained after filtering for journals. Applying the category filter for *education systems* reduced the dataset to 18,502. Focusing on SDGs 10 and 17 yielded 89 English journals on leadership, collaboration, and student engagement, available in the Repository UAD [11].

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) was used for transparent selection and bibliometric mapping with VOSviewer, extracting authorship, year, keywords, and citations. Themes covered principal-teacher interactions, urban-rural leadership differences, and Generation Alpha's engagement, combining quantitative trends and qualitative insights.

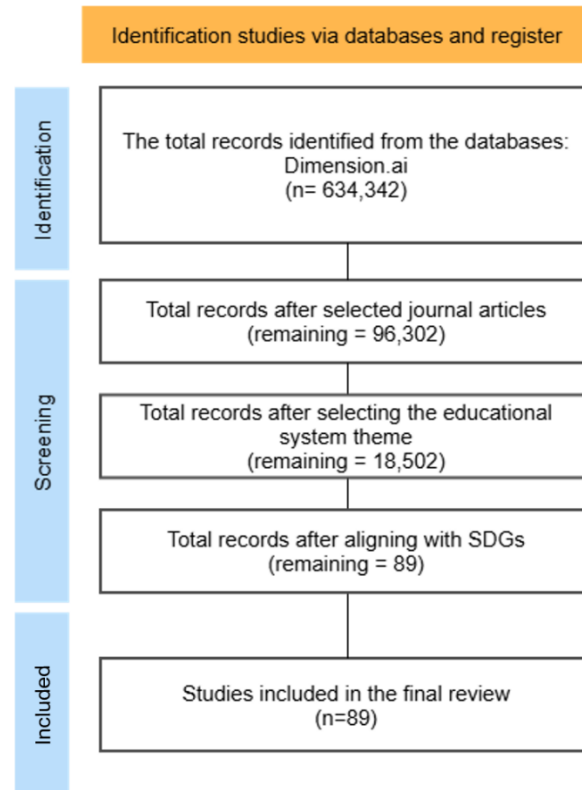


Figure 1.
Article selection process.

3. Results

3.1. Number of Publications

Between 2020 and 2025, publications on school leadership, principal-teacher collaboration, and Generation Alpha's engagement steadily grew. Only eight studies appeared in 2020, rising to 14 in 2021 and stabilizing at 12 in 2022, showing increasing academic interest. A more pronounced increase occurred in 2023 with 15 studies, followed by a significant rise in 2024 (20) and 2025 (21), making these years the peak of publication activity.

This upward trend suggested that the intersection of educational leadership, urban-rural school contexts, and Generation Alpha's engagement had become a critical focus in recent studies. The growth in 2024 and 2025 reflected heightened global discourse on SDG 4 (Quality Education), 10 (Reduced Inequalities), and 17 (Partnerships), closely tied to leadership collaboration and equitable student engagement. Data also showed this field evolving toward sustainable, inclusive, and technology-integrated approaches to education in both urban and rural contexts. (Reduction \approx 20%).

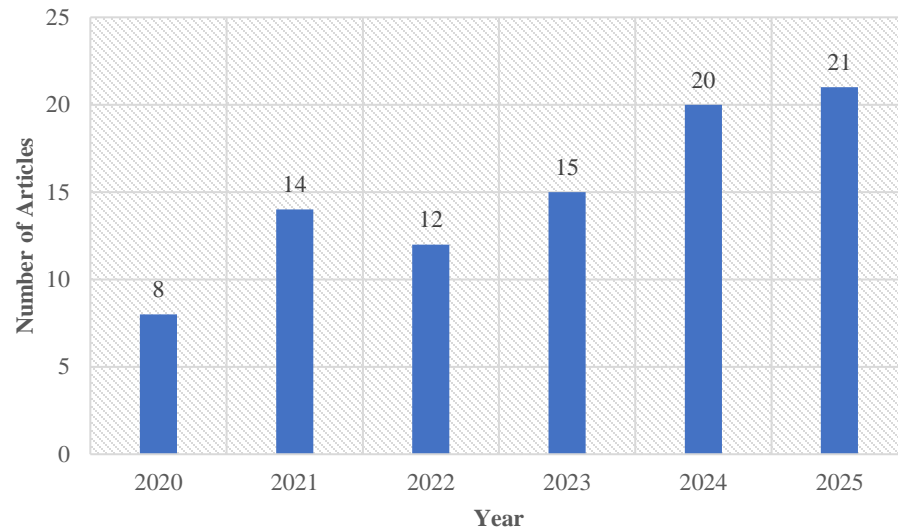


Figure 2.
Number of publications related to the issue.

3.2. The Number of Citations

Based on the citation trends of the 90 studies published between 2020 and 2025, a clear pattern of growing academic recognition was observed regarding studies on principal-teacher interactions in urban and rural schools and the influence on Generation Alpha's learning engagement. Publications from 2020 had no recorded citations, but citations commenced in 2021 (32), followed by a sharp increase in 2022 (94) and a continuous significant rise in 2023 (189) and 2024 (316). This upward trend showed that school leadership, teacher collaboration, and students' engagement issues had gained considerable traction and become essential references in global academic discourse.

Although the number of publications in 2025 was higher than in previous years, the total citations slightly decreased to 295. This phenomenon could be explained by the time factor, as newly published studies typically require more time to be widely accessed and cited. In general, this pattern confirms that the study topic is highly relevant, reflected in the growing number of publications and the significant scholarly impact generated, particularly in the context of school leadership and Generation Alpha's engagement across diverse social settings.

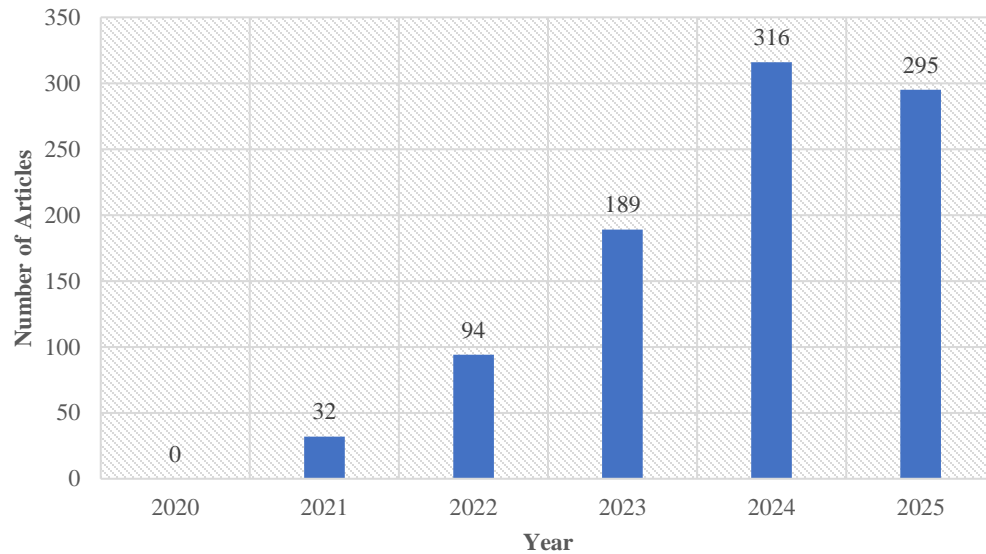


Figure 3.
Number of citations related to the issue.

3.3. Journal

The analysis of the number of journals on social interactions between school principals and teachers in urban and rural contexts, and the influence on Generation Alpha's learning engagement, showed a consistent upward trajectory. In 2020, only eight journals published relevant studies, but this number steadily increased to 13 in 2021 and remained relatively stable in 2022, with 12. From 2023 onward, the growth became more evident, with 15, 18, and 20 journals in 2023, 2024, and 2025, respectively. This expansion showed that the topic had attracted more studies and diversified across various scholarly outlets. The steady rise in the number of journals reflected the cross-disciplinary relevance of the theme, engaging fields such as educational leadership, teacher collaboration, students' engagement, and sustainable education, consistent with SDGs. The increasing presence of the topic in multiple journals suggested strengthening its academic legitimacy and acknowledging the importance of addressing educational challenges in urban and rural schools.

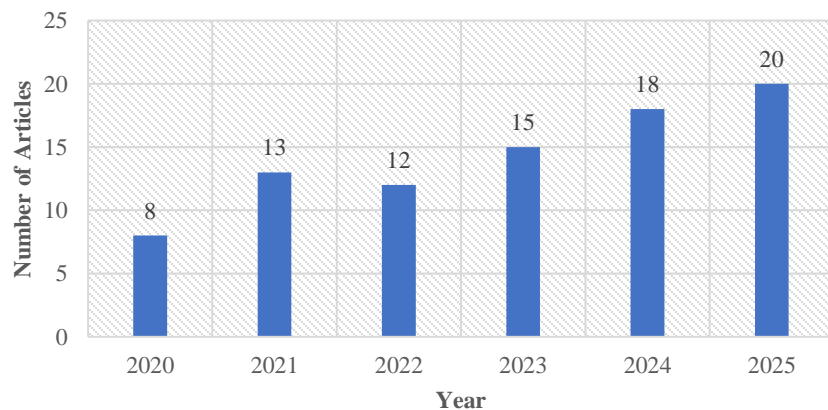


Figure 4.
Number of journals related to the issue.

3.4. Network Visualization for Co-Occurrence

Network visualization of keyword co-occurrence showed two main clusters representing distinct yet interconnected themes. The red cluster was dominated by terms, such as *teacher*, *school*, *education*, *inequality*, *child*, *data*, and *student*, reflecting a strong focus on micro-level educational dynamics, particularly around principal-teacher interaction, students' learning engagement, and equity issues in school contexts. Meanwhile, the green cluster focused on *collaboration*, *partnership*, *university*, *higher education*, *process*, and *knowledge*, showing macro-level perspectives, specifically institutional collaboration, systemic processes, and contributions to SDGs. Central nodes, such as *study*, *education*, *student*, *teacher*, and *school*, bridged the two clusters, showing the interconnectedness through a shared discourse on education. This result suggested that while one strand of study focused on direct interactions in school environments, another strand situated these interactions in broader systemic and policy-oriented frameworks. The visualization showed the importance of integrating micro- and macro-level perspectives to comprehensively understand school leadership, urban-rural differences, Generation Alpha's engagement, and the association with sustainable educational development.

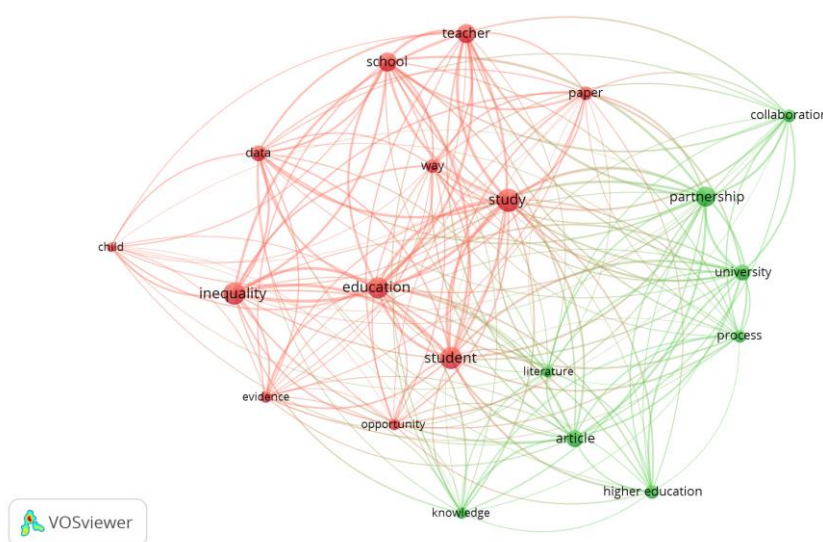


Figure 5.
Network visualization for co-occurrence.

3.5. Overlay Visualization for Co-Occurrence

Overlay visualization of keyword co-occurrence provided insights into the temporal evolution of study themes between mid-2022 and early 2023. Keywords shaded in darker blue tones, such as *school*, *child*, and *data*, represented an earlier focus, often centered on foundational educational contexts and inequality issues. The green and yellow hues keywords, such as *teacher*, *study*, *student*, *inequality*, and *education*, appeared in the middle of the timeline, showing that by late 2022, attention shifted toward the role of teachers and schools in addressing engagement and equity. The most recent trends (bright yellow nodes), such as *study*, *education*, *inequality*, and *teacher*, showed a growing interest in more practical and evaluative studies on school leadership, principal-teacher collaboration, and the impact on students' learning. Partnership, university, higher education, and collaboration (green) represented ongoing but slightly later-developing discourses. These discourses served to bridge micro-level school dynamics with broader systemic reforms, while also showing the role of education in contributing to the achievement of the Sustainable Development Goals (SDGs). This temporal layering showed that scholarship on social interactions in schools was evolving from descriptive studies of inequality and

classroom dynamics toward more systemic and policy-oriented explorations, while grounding the discourse in teacher-student engagement.

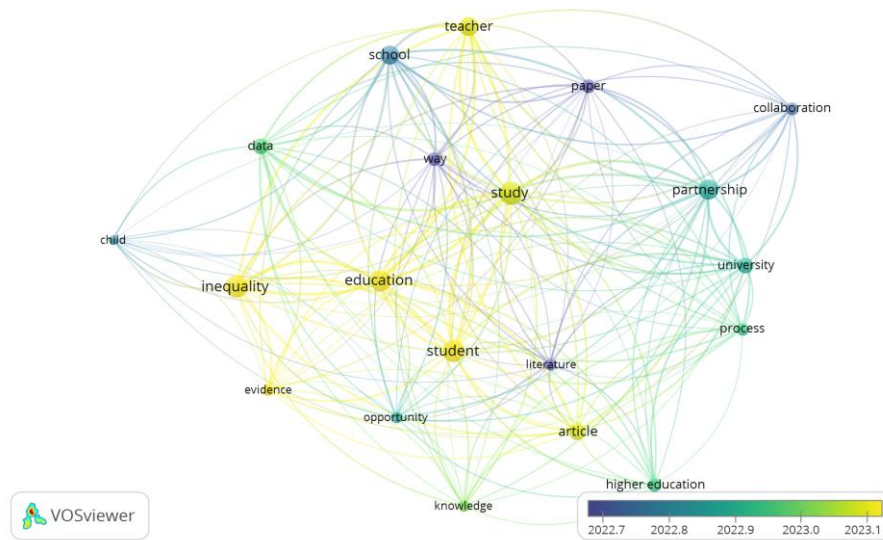


Figure 6.
Overlay visualization for co-occurrence.

3.6. Density Visualization for Co-Occurrence

Density visualization of keyword co-occurrence showed the thematic concentration of studies in the field. In the map, the most densely clustered and brightly colored nodes were *inequality*, *education*, *study*, *student*, *teacher*, and *school*. These keywords represented the central discourse, showing that the majority of scholarly works converged around understanding the role of education and educators in addressing inequality and enhancing students' outcomes. Surrounding these core clusters were moderately dense keywords, such as *article*, *partnership*, *university*, and *higher education*, suggesting a growing emphasis on institutional collaboration and systemic perspectives. On the periphery, *child*, *data*, *evidence*, *opportunity*, *process*, and *knowledge* appeared less dense but still relevant, functioning as supporting or contextual elements in the broader study agenda. This pattern showed that the field was anchored in fundamental educational issues, particularly inequality and students' engagement. It was gradually branching out toward institutional reforms, partnerships, and higher education contexts, reflecting an expanding scope of inquiry.

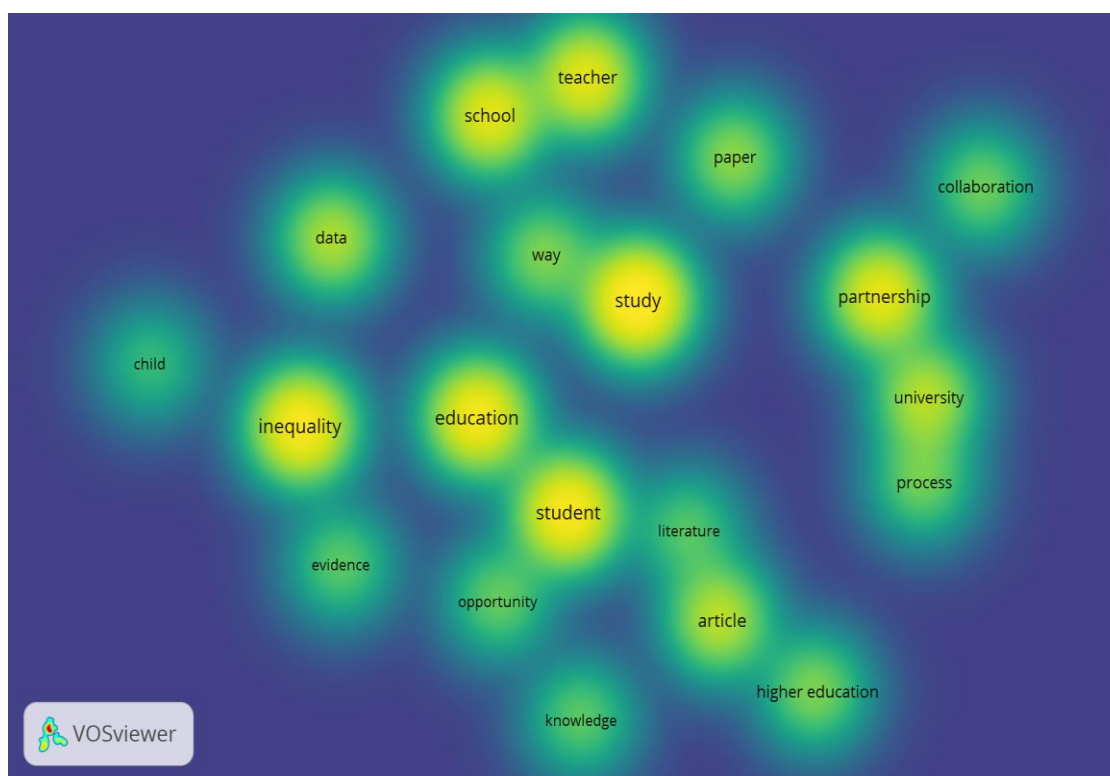


Figure 7.
Density visualization for co-occurrence.

4. Discussion

4.1. Trends in Publications on Principal-Teacher Interaction

Studies on principal-teacher interaction have increased over the past decade, showing leadership collaboration as key to school effectiveness. Early studies focused on the principal's instructional role and top-down strategies affecting teacher performance and students' outcomes. Recent studies show reciprocal interactions and shared leadership, reflecting a distributed, relational approach. Principal-teacher collaboration also fosters students' engagement and supports school improvement [12, 13]. More recent publications further emphasize how these interactions are mediated by sociocultural contexts, such as urban versus rural school settings [14, 15] and the influence on Generation Alpha's learning engagement. This result showed a trend toward contextualized leadership studies that recognized the diversity of school environments [16].

Another visible trend was the integration of principal-teacher interaction studies into global policy frameworks such as SDGs, specifically SDG 4 on quality education. The publications also showed that effective principal-teacher communication enhanced motivation, improved classroom practices, and reduced educational inequalities [17, 18]. Publications showed a shift to leadership-as-interaction, focusing on partnership, shared responsibility, and inclusive, equitable, sustainable school development.

4.1.1. Citation Patterns and Scholarly Impact

The sharp increase in citations from 32 in 2021 to 316 in 2024 indicates a significant rise in the scholarly influence of this field. This upward trend suggests that research on principal-teacher collaboration, particularly in urban and rural contexts, has achieved stronger academic visibility within global educational discourse. The modest decline to 295 citations in 2025, despite the higher number of publications, can be attributed to the natural citation lag observed in bibliometric and scientometric

studies [19, 20]. Citation accumulation often requires a temporal diffusion period during which new research gradually gains traction among peers. This pattern is consistent with previous analyses of leadership and management research, which show that publication volume typically precedes citation growth by one to two years [21]. The data, therefore, confirm that the field has not only expanded in volume but also matured in academic recognition and relevance.

The findings also indicate that studies emphasizing relational, contextual, and participatory aspects of leadership have generated higher levels of academic attention. Azorín and Fullan [22] and Harris and Jones [23] observed that collaboration, trust-building, and collective efficacy have become central elements in the evolution of leadership research following the COVID-19 pandemic. Likewise, Leithwood et al. [24] identified relational trust and shared moral purpose as the defining characteristics of successful school leadership. This body of work aligns with a broader movement in the field toward distributed leadership, where authority and responsibility are shared across actors within the school community [25]. The increasing citation of such studies underscores a paradigm shift from managerial to collaborative leadership models, reflecting the contemporary recognition that effective leadership depends on interpersonal networks and mutual accountability rather than positional hierarchy [1, 26].

Moreover, the focus on equity, engagement, and sustainability within these frequently cited works illustrates the intersection of leadership research with global education reform agendas. Recent studies emphasize how leadership practices contribute to achieving Sustainable Development Goal (SDG) 4 on Quality Education and SDG 10 on Reduced Inequalities through inclusive, participatory, and context-responsive approaches [27]. For example, Patrick [18], Azorín and Fullan [22], and Gillen et al. [28] argue that collaborative and networked leadership is essential for large-scale system improvement and equity across diverse educational settings. Similarly, Sezer and Uzun [4] and Liu and Gruijters [29] found that principal–teacher collaboration promotes teacher learning and student engagement across varying socioeconomic contexts. These relational and socially grounded studies appear to attract greater academic attention because they address the pressing global challenges of educational inequality, digital transformation, and sustainability [7, 30].

In addition, citation data suggest that scholars increasingly value integrative research that bridges theory and practice. Bibliometric analyses in adjacent fields, such as teacher professional learning [31] and instructional leadership [19], reveal that studies combining empirical evidence with practical implications tend to achieve higher citation impact. The growing emphasis on school–community partnerships, professional learning communities (PLCs), and digital collaboration further enhances the relevance of these studies for policymakers and practitioners [22, 32]. Consequently, the rise in citation counts may reflect not only academic interest but also the practical utility of research that addresses post-pandemic realities in education.

Taken together, these patterns provide strong evidence of the consolidation of school leadership research as a mature and globally connected field. The convergence of relational, distributive, and sustainability-oriented approaches illustrates an epistemological broadening of educational leadership studies beyond organizational management toward socioconstructivist and systems-based perspectives [23, 33, 34]. The evolving citation structure thus reveals how principal–teacher collaboration has become a key lens through which the academic community conceptualizes leadership effectiveness, equity, and innovation in both urban and rural schools.

4.1.2. Expansion Across Journals and Disciplinary Domains

The increasing number of journals publishing research on leadership collaboration, from eight in 2020 to twenty in 2025, illustrates the expanding disciplinary and geographical reach of the field. This pattern reflects the growing academic recognition that collaborative leadership is a multidimensional concept situated at the intersection of educational administration, teacher development, technology integration, and sustainability. Earlier bibliometric studies in education also report similar diversification, showing that educational leadership research is becoming progressively interdisciplinary [21, 35, 36].

The proliferation of outlets beyond traditional educational management journals signifies that collaboration and leadership are increasingly studied not only as organizational phenomena but also as pedagogical and social processes. For instance, journals in teacher education and professional development have published studies examining principal–teacher relationships as part of continuous professional learning [4, 7]. In parallel, publications in educational technology have investigated how digital tools facilitate shared decision-making and collaborative supervision, emphasizing the role of digital leadership in fostering connected learning communities [5, 36, 37].

This diversification of publication venues indicates that research on leadership collaboration now contributes to multiple intellectual traditions. Within sociology and education policy, collaboration has been framed as a mechanism for achieving systemic change and equity, resonating with Sustainable Development Goal 10 on reducing inequalities [29, 38, 39]. In management and organizational studies, it has been examined through the lens of distributed and transformational leadership theories that emphasize capacity-building and empowerment [24, 36]. The growing representation of the topic in journals focused on sustainability and innovation further highlights the alignment between leadership collaboration and the global agenda for sustainable education [22, 27].

The increasing diversity of publication outlets also enhances the academic legitimacy of leadership collaboration as a research domain. According to Hairston and Crawford [17], the visibility of leadership scholarship across disciplinary boundaries is a hallmark of its maturation. Similarly, Portera et al. [40] argue that the shift toward intersectoral publication spaces reflects an epistemological broadening of the field toward systems thinking and relational perspectives. Such diffusion enables new cross-disciplinary synergies between scholars in educational leadership, learning sciences, and social innovation, resulting in a richer and more contextualized understanding of leadership phenomena.

However, the expansion also presents methodological challenges. Variation in research design, data sources, and analytical frameworks across journals may limit the comparability of findings and the accumulation of coherent knowledge. As Daniëls et al. [41] noted, the heterogeneity of empirical approaches in distributed leadership research often complicates synthesis. Future meta-analyses should therefore distinguish between conceptual, descriptive, and empirical studies to accurately assess the evidential strength of the field. Methodological pluralism should be encouraged, but it must be accompanied by consistent reporting standards and theoretical clarity [19, 26].

In summary, the widening range of journals and disciplinary engagement indicates a field that is dynamic, interconnected, and increasingly relevant to multiple educational and policy contexts. The diffusion of leadership collaboration research into diverse academic spaces represents both a validation of its theoretical importance and an opportunity for more integrated and comparative inquiry across national and disciplinary boundaries.

4.1.3. Thematic and Conceptual Evolution

The analysis of keyword networks revealed two primary clusters that together represent the intellectual structure of the field. The first cluster, associated with micro-level issues, includes keywords such as teacher, student, school, education, and inequality. The second cluster represents macro-level issues such as collaboration, partnership, university, and process. The presence of central nodes, such as education and teachers, that connect both clusters, demonstrates a growing integration between school-level practice and institutional or policy frameworks. This dual focus reflects the broader transformation in educational research that seeks to link classroom practices with systemic reform [24, 33].

The overlay visualization further illustrates that earlier studies, particularly those published between 2020 and 2022, concentrated on topics such as inequality and foundational learning contexts. Later publications, especially those from 2023 onward, shifted toward practical and evaluative research focusing on collaboration, teacher engagement, and partnerships. This evolution mirrors the transition in leadership research from descriptive studies toward applied investigations that assess impact and sustainability [7, 21, 41]. The growing inclusion of keywords such as partnership, higher education,

and knowledge also suggests an emerging awareness of education as an interconnected ecosystem that bridges primary, secondary, and tertiary levels.

The density visualization reinforces this conclusion. The most concentrated themes are inequality, education, study, student, teacher, and school, which represent the intellectual core of the field. Moderately dense terms such as partnership and higher education signal a gradual movement toward institutional collaboration and systemic reform. The results, therefore, demonstrate that the field remains anchored in traditional educational concerns while expanding toward broader cross-sectoral dimensions.

4.2. Urban-Rural Differences in School Leadership

Urban and rural schools show different principal-teacher interactions, with urban schools using formal collaboration, accountability, data-driven practices, and distributed leadership [13, 14]. Meanwhile, rural schools consistently face constraints, such as limited human resources, professional isolation, and infrastructural deficits, which shape leadership practices into more relational and community-centered forms [15, 42].

Rural principals often act as community liaisons and problem-solvers, needing strong bonds with teachers to sustain schools and motivate staff [43-45]. However, urban principals balance managerial and pedagogical roles with strategic teacher interactions, while rural leaders prioritize relationships, and urban leaders focus on structure and technology [39, 46].

Context-sensitive leadership is crucial, as geographic, cultural, and resource differences shape collaboration. Urban models require adaptation for rural schools, and rural practices can enhance urban collaboration. This result showed that effective leadership was both locally situated and globally relevant, requiring nuanced strategies to strengthen students' engagement across diverse educational landscapes [47-51].

4.3. Impact on Generation Alpha's Engagement

Principal-teacher collaboration influenced Generation Alpha's engagement by supporting innovative teaching consistent with digital and interactive learning preferences [38, 52]. These practices included integrating digital tools, project-based learning, and co-designed classroom activities that resonated with students' need for agency and interactivity. Leadership practices shaped teachers' adaptation to digital, student-centered learning and supported professional learning communities to increase engagement [53, 54]. Other studies also showed that instructional leadership models connect teaching practices with students' engagement goals [29, 55]. These results suggest that principal-teacher interactions are not merely administrative but serve as a catalyst for transforming classroom culture into more interactive and future-oriented spaces.

The literature identified both challenges and opportunities in various school contexts. Rural schools often use close principal-teacher relationships to try contextually relevant methods, while urban schools rely on structured, data-driven approaches to maintain engagement [56, 57]. Sustaining Generation Alpha's engagement requires adaptive leadership and teacher empowerment, creating environments that increase achievement and foster creativity, collaboration, and resilience [58, 59].

4.4. Contributions to Sustainable Development Goals (SDGs)

The final theme was related to how principal-teacher interactions contributed to global education goals, particularly SDG 4 (Quality Education). Many publications connect leadership and collaboration to equity, quality, and access [60, 61]. These interactions extended beyond administrative coordination, representing critical levers for shaping equitable and sustainable school systems.

Principal-teacher collaboration promotes equity in education through inclusive practices, professional development, and community partnerships, bridging policy-classroom gaps [62, 63]. Other studies emphasize the importance of distributed leadership in fostering inclusive and resilient school environments [56, 57]. This focus was consistent with SDG 4, which promotes lifelong learning

opportunities and the reduction of educational disparities across contexts.

In addressing SDG challenges, rural schools relied on relational trust and adaptive leadership, while urban schools used data-driven strategies for accountability and equity [30, 64]. These results suggested that leadership strategies, while context-specific, shared a common commitment to advancing global sustainability agendas through education.

The convergence of leadership studies with the sustainability agenda showed that education systems are embedded in wider commitments to development and human rights. Effective principal-teacher collaboration drives systemic transformation by advancing social justice, equitable resource distribution, and innovative teaching practices. This positions school leadership not only as a local concern but also as a significant contributor to achieving Sustainable Development Goals [65-67].

4.5. Thematic Cluster Summary

Table 1 synthesizes the results into four core clusters that connect the relationship between leadership interactions and Generation Alpha's engagement with the global education agenda.

Table 1.
Thematic Clusters from Literature Review.

No.	Variable	Article Title	Year	Novelty	Result	Future Potential
1	Social Interaction	The importance of motivation in the collaborative learning process in pandemic and post-pandemic undergraduate students [68]	2024	Investigate how digital social interactions influence students' motivation to learn after the pandemic.	Found a significant positive correlation between digital social interactions and learning motivation.	Can inform educational strategies to improve post-pandemic learning environments through digital tools.
2	Social Interaction	Enhanced social connectivity in hybrid classrooms versus academic centrality in online settings [69]	2023	Focuses on the role of teachers in facilitating social interaction in hybrid classrooms.	Showed that active teacher involvement in hybrid classrooms fosters better student engagement.	Provides insights into hybrid classroom dynamics, potentially guiding teacher training programs.
3	Social Interaction	Social interaction and agency in self-organizing student teams during their transition from face-to-face to online learning [70]	2022	Explores peer engagement and social interaction quality in online learning environments.	Peer engagement improves when social interaction is structured, leading to better learning outcomes.	Suggests further development of peer interaction models for online education.
4	Social Interaction	A person-centered approach to studying students' socio-emotional interaction profiles and regulation of collaborative learning [71]	2022	Examines how socio-emotional skills affect collaboration in digital learning settings.	Socio-emotional skills are critical in fostering collaboration and positive interactions in digital contexts.	May lead to curricula that integrate socio-emotional learning for digital classroom environments.
5	Social Interaction	Social interaction and online learning efficiency for middle school students: The mediating role of social presence and learning engagement [72]	2024	Explores the link between social presence and student interaction in technology-driven classrooms.	A strong social presence enhances student interaction and engagement in tech-based classrooms.	Highlights the need for designing technology that fosters a strong sense of presence.
6	Urban-Rural	Urban and Rural	2021	Focuses on the	Identified	Can influence

No.	Variable	Article Title	Year	Novelty	Result	Future Potential
	Context	Dimensions of the Role of Education in Inequality: A Comparative Analysis between Indonesia, Myanmar, and the Philippines [73]		differences in educational access and quality between urban and rural schools.	significant disparities in educational resources and outcomes between urban and rural areas.	policy changes to address urban-rural educational disparities.
7	Urban–Rural Context	Middle years students' engagement with science in rural and urban communities in Australia: exploring science capital, place-based knowledge, and familial relationships [74]	2021	Analyzes the role of social capital in student engagement in urban and rural high schools.	Social capital plays a vital role in fostering student engagement, particularly in rural schools.	Supports initiatives that enhance social capital in educational settings, especially in rural areas.
8	Urban–Rural Context	Teacher's perceptions, institutional challenges, and educational sustainability during Covid-19 in Ecuador [75]	2021	Explores teacher perceptions of educational challenges in urban and rural areas during the pandemic.	Teachers in rural areas faced greater challenges in adapting to the shift to online education.	It could lead to targeted support for rural teachers in future crises.
9	Urban–Rural Context	Determinants of the digital outcome divide in E-learning between rural and urban students: Empirical evidence from the COVID-19 pandemic based on capital theory [76]	2021	Examines the digital divide between urban and rural schools and its impact on learning outcomes.	The digital divide significantly affects student performance, with rural students being at a disadvantage.	It could inform the development of policies and infrastructure to bridge the digital divide.
10	Urban–Rural Context	Towards a New Approach to Community-Based Rural Development: Lessons Learned from Indonesia [77]	2023	Focuses on a case study from Indonesia regarding rural education transformation through community-based learning.	Community involvement in rural education leads to improved educational access and outcomes.	Offers a model for rural education reform in other regions, emphasizing community empowerment.
11	Student Engagement	Impact of active learning strategy on the student engagement [78]	2021	Investigates the impact of active learning strategies on student engagement in online learning.	Active learning strategies significantly improve student engagement in online education.	Can inform the design of more engaging and interactive online learning environments.
12	Student Engagement	Secondary teachers' perceptions of the importance of pedagogical approaches to support students' behavioral, emotional, and cognitive	2023	Develops a model for measuring emotional, behavioral, and cognitive engagement in secondary education.	Offers a comprehensive approach to measuring student engagement across different dimensions.	Can guide educators in implementing a more holistic approach to student engagement.

No.	Variable	Article Title	Year	Novelty	Result	Future Potential
		engagement [79]				
13	Student Engagement	Teachers' autonomy support and student engagement: A systematic literature review of longitudinal studies [80]	2022	Examines the long-term effects of teacher-student interaction on student engagement.	Positive teacher-student interactions lead to sustained engagement over time.	Suggests enhancing teacher-student relationships as a way to improve long-term student engagement.
14	Student Engagement	Enhancing student motivation and engagement through a gamified learning environment [81]	2023	Studies the impact of gamification on student engagement in STEM education.	Gamification significantly increases student engagement and interest in STEM subjects.	Can inform the development of gamified learning tools to boost STEM education engagement.
15	Student Engagement	Impacts of South Asian culture, income, education, and expectations on parental involvement in children's academic achievement [82]	2024	Explores how cultural values impact student engagement in schools across the Asia-Pacific region.	Cultural values play a crucial role in shaping student engagement across different contexts.	Can guide culturally responsive teaching strategies in diverse educational settings.
16	Generation Alpha	The impact of digital learning environments on cognitive, social, and emotional development in Generation Alpha children: A comparative analysis [83]	2023	Focuses on the digital habits and cognitive styles of Generation Alpha and their educational implications.	Generation Alpha learners exhibit unique cognitive styles shaped by their digital environment.	It could shape future educational strategies and content designed specifically for Generation Alpha.
17	Generation Alpha	Investigating Parental Involvement in Alpha Generation's Digital Activities [84]	2024	Investigates the role of digital parenting styles in Generation Alpha's school engagement.	Digital parenting styles have a significant impact on how Generation Alpha engages with school.	Offers insights into how parenting interventions can improve school engagement for this generation.
18	Generation Alpha	Embracing the technological metamorphosis: Envisioning higher education for Generation Alpha in a shifting educational landscape [85]	2023	Emphasizes the need for innovative pedagogies that foster creativity and critical thinking in Generation Alpha learners.	Highlights the importance of adapting teaching strategies to meet the needs of this generation.	Can inform educational policy and curriculum development to cater to the unique needs of Generation Alpha.
19	Generation Alpha	Preparing pre-service teachers for Generation Alpha: A social innovation perspective [86]	2024	Explores the role of digital literacy and moral education for Generation Alpha students.	Digital citizenship education is crucial for the moral development of Generation Alpha students.	Can inform the development of digital citizenship curricula for future generations.
20	Generation Alpha	Leadership Approach for Generation Alpha and a Greener Future: The Health Professionals of Tomorrow [87]	2025	Discusses how educational leadership needs to adapt to the changing learning behaviors of Generation Alpha.	Educational leadership must evolve to support the unique needs and behaviors of Generation Alpha learners.	Offers insights for educational leaders to better adapt to the evolving needs of the next generation of students.

These articles, as shown in Table 1, are often sought after on platforms like Google Scholar, primarily due to their relevance to ongoing educational transformations and emerging trends in teaching, learning, and digital engagement. Below is a breakdown of why these articles are frequently found and searched for, organized by thematic clusters.

Articles focusing on social interaction and engagement in digital, hybrid, and online learning environments have become increasingly relevant, especially following the COVID-19 pandemic. Key terms like *digital social interaction*, *hybrid classrooms*, and *peer engagement* often lead to these articles appearing on Google Scholar. The ongoing trend of integrating technology into classrooms, alongside the need to maintain social interaction and collaboration, makes these studies highly visible. Researchers, educators, and policymakers are constantly seeking ways to improve student engagement in these settings, which drives interest in articles exploring these topics. The pandemic has made these themes even more crucial, with many educators looking for strategies to enhance online and hybrid learning [88].

The digital divide and educational disparities between urban and rural areas are key focus areas of these articles. Keywords such as *urban-rural education disparities*, *digital divide*, and *educational access* are used to identify these articles in search results. With the global shift to digital learning, there is increasing concern about unequal access to technology and resources in rural areas, leading to greater interest in articles that address these gaps [36, 37, 89]. Policymakers and education advocates seek evidence-based strategies to reduce these disparities, making these articles particularly valuable. These studies provide insights into how digital tools and community-based learning can bridge the gap in educational outcomes, making them highly relevant in the search for equitable educational solutions.

Articles that explore innovative methods to increase student engagement, such as *active learning strategies*, *gamification*, and *cognitive engagement*, consistently appear in Google Scholar searches. Educators are increasingly interested in improving student participation, especially in the context of digital and STEM education [60, 90]. With the rise of online learning environments, there is a greater demand for methods that keep students motivated and engaged. Keywords like *active learning in digital education* and *student engagement in STEM* are frequently used by researchers and educators searching for new strategies to enhance student involvement. As educational institutions strive to adapt to the digital era, these articles provide actionable insights into creating more engaging learning environments.

Generation Alpha, the newest cohort of students, is becoming a significant focus of research [13, 91]. Articles that explore *Generation Alpha learning styles*, *digital habits*, and *educational implications* appear in Google Scholar when these keywords are entered. As digital natives, Generation Alpha's unique characteristics and learning behaviors are of great interest to educational researchers and practitioners. With this generation's rapid integration of technology into their daily lives, understanding how to best educate them is critical. Keywords like *pedagogical approaches for Generation Alpha* and *digital citizenship for Generation Alpha* reflect the growing interest in adapting teaching methods to meet the needs of this emerging group of learners. These articles are at the forefront of shaping future educational strategies, making them highly searchable.

The need for culturally responsive teaching and effective educational leadership is another driving force behind the visibility of these articles. Keywords like *cultural values in education*, *student engagement across cultures*, and *educational leadership in Generation Alpha* guide searches toward these studies. As educational environments become increasingly diverse, educators are looking for ways to adapt teaching strategies to respect and incorporate cultural differences [33]. Moreover, articles that address how educational leadership can evolve to meet the needs of future learners, particularly Generation Alpha, are becoming more prominent. These articles provide insights into how school leaders can foster environments that are not only inclusive but also aligned with the rapidly changing needs of learners in the digital age.

In summary, these articles gain traction on academic platforms because they align with current educational trends and challenges. Keywords related to digital transformation, student engagement, the urban-rural education divide, and the unique needs of Generation Alpha lead to higher visibility in search results. As education continues to evolve, these articles serve as essential resources for those looking to understand and address the ongoing shifts in teaching and learning. The growing interest in these topics reflects the broader trends in education, with an increasing emphasis on inclusivity, technology integration, and the development of future-focused pedagogies.

5. Conclusion

This study demonstrates that social interactions between school principals and teachers play a pivotal role in shaping learning environments that engage Generation Alpha students, who exhibit unique learning characteristics such as digital nativity, preference for interactivity, and demand for personalized learning experiences. The systematic literature review and bibliometric analysis revealed a consistent increase in publications, citations, and journal outlets from 2020 to 2025, reflecting a growing scholarly recognition of the importance of leadership collaboration in education.

Principal-teacher interactions are increasingly framed as interdependent and relational rather than hierarchical, with distributed and collaborative leadership models fostering shared responsibility, trust, and mutual learning. These interactions directly influence Generation Alpha's engagement by shaping institutional culture, promoting motivation, creativity, and a sense of belonging, while also integrating digital tools and inclusive pedagogical practices.

The study highlights that urban and rural contexts shape principal-teacher interactions differently. Urban schools benefit from structured systems, technological resources, and formalized professional networks, whereas rural schools rely more on community cohesion, relational trust, and culturally embedded practices. Despite these contextual differences, effective leadership collaboration in both settings contributes to equitable educational opportunities, supporting SDG 4 (Quality Education), SDG 10 (Reduced Inequalities), and SDG 17 (Partnerships).

Furthermore, leadership collaboration serves as a mechanism to connect micro-level classroom dynamics with broader systemic reforms, bridging pedagogical, organizational, and policy perspectives. By fostering inclusive, sustainable, and technology-mediated learning environments, principal-teacher interactions not only enhance Generation Alpha's engagement but also contribute to advancing global educational goals.

Finally, the study identifies methodological gaps and calls for future research that standardizes empirical approaches, emphasizes cross-contextual comparisons, and explores the direct impact of specific collaboration practices, such as joint curriculum design, shared feedback systems, and teacher-led innovation, on Generation Alpha's learning outcomes. Strengthening these interactions is crucial for supporting equitable, adaptive, and resilient educational systems capable of meeting the demands of digitally native learners and contributing meaningfully to sustainable development.

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Artificial Intelligence:

Artificial intelligence (AI) was not directly applied in the core data analysis of these studies. However, AI-assisted tools were used in several stages to improve efficiency and clarity. The primary database used was Dimensions.ai, which integrates AI-driven indexing and citation analytics to support comprehensive literature retrieval. VOSviewer was used for bibliometric mapping and co-occurrence network analysis. Data cleaning, tabulation, and descriptive statistics were carried out using Microsoft Excel. Visual representations, including conceptual diagrams and flowcharts, were created with Cacoo, while NVivo facilitated qualitative thematic coding and clustering. A generative AI tool (ChatGPT, OpenAI) was also used exclusively for language refinement and editing of the manuscript. The use of AI did not extend to data interpretation, analysis, or drawing of study conclusions.

Institutional Review Board Statement:

This study included adult participants, such as teachers, academic staff, and ninth-grade students (aged 15 years or older). According to the ethical review guidelines of the Finnish National Board on Research Integrity (TENK), studies of this nature do not require evaluation by an institutional research ethics board, as participants were capable of providing informed consent. All procedures were conducted in accordance with ethical standards, and informed consent was obtained from all participants before data collection.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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References

- [1] L. Piccerillo, A. Tescione, A. Iannaccone, and S. Digennaro, "Alpha generation's social media use: Sociocultural influences and emotional intelligence," *International Journal of Adolescence and Youth*, vol. 30, no. 1, p. 2454992, 2025. <https://doi.org/10.1080/02673843.2025.2454992>
- [2] B. Rathore, "Future of AI & generation alpha: ChatGPT beyond boundaries," *Refereed Multidisciplinary Journal*, vol. 12, no. 1, pp. 63–68, 2023. <https://doi.org/10.56614/eiprmj.v12i1y23.254>
- [3] D. Mustaji, D. Sulisworo, and S. W. M. Diningrat, "Educational technology and the future of learning from a global perspective," *Buletin Edukasi Indonesia*, vol. 4, no. 01, pp. 30–39, 2025. <https://doi.org/10.56741/bei.v4i01.807>
- [4] Ş. Sezer and T. Uzun, "The relationship between school principals' social-emotional education leadership and teachers' organizational trust and job performance," *International Journal of Leadership in Education*, vol. 26, no. 6, pp. 1062–1081, 2023. <https://doi.org/10.1080/13603124.2020.1849812>
- [5] A. T. Mujallid, "Digital active learning strategies in blended environments to develop students' social and emotional learning skills and engagement in higher education," *European Journal of Education*, vol. 59, no. 4, p. e12748, 2024. <https://doi.org/10.1111/ejed.12748>
- [6] R. Schwarzhaupt, F. Liu, J. Wilson, F. Lee, and M. Rasberry, "Teachers' engagement and self-efficacy in a PK–12 computer science teacher virtual community of practice," *Journal of Computer Science Integration*, vol. 4, no. 1, pp. 1–14, 2021. <https://doi.org/10.26716/jcsi.2021.10.8.34>
- [7] W. Zhang, "Social justice leadership for students' holistic lifelong learning through professional learning community, engagement, and sustainability: Perspectives of principals and teachers in the United States," *Global Scientific and Academic Research Journal of Multidisciplinary Studies*, vol. 3, no. 5, pp. 36–59, 2024.

- [8] M. Megawati and D. Sulisworo, "Transformative education in character development of students in religious-based schools: Narrative review," *Edu Cendikia: Jurnal Ilmiah Kependidikan*, vol. 4, no. 03, pp. 1475–1488, 2024.
- [9] D. Pérez-López, A. López, P. DasMahapatra, and J. Capmany, "Multipurpose self-configuration of programmable photonic circuits," *Nature Communications*, vol. 11, no. 1, p. 6359, 2020.
- [10] D. Sulisworo, U. Q. A'yun, and I. Maryani, "Using NVivo to identify cultural, social, and contextual factors influencing leadership practices in Islamic-based schools: A qualitative research," *International Journal of Educational Management and Innovation*, vol. 6, no. 1, pp. 1–15, 2025. <https://doi.org/10.12928/ijemi.v6i1.11748>
- [11] D. Sulisworo, "Dataset of bibliometrics study taken from dimension," Repository Universitas Ahmad Dahlan, 2025. http://eprints.uad.ac.id/88089/1/Dimensions-Publication-2025-09-20_11-44-39.csv
- [12] L. L. Hadar and H. Baharav, "University-school partnership in education as a context for teacher professional development," *International Journal of Educational Research*, vol. 133, p. 102693, 2025. <https://doi.org/10.1016/j.ijer.2025.102693>
- [13] L. A. Williams, L. Atkinson, S. Dean, T. W. McCarty, E. Mathews, and S. Jaques-McMillin, "Deeper learning and leadership development in a school–university partnership with a rural district," *Journal of Educational Administration*, vol. 62, no. 1, pp. 40–56, 2023. <https://doi.org/10.1108/jea-02-2023-0046>
- [14] P. K. A. Ahiaku, C. Uleanya, and G. C. Muyambi, "Rural schools and tech use for sustainability: The challenge of disconnection," *Education and Information Technologies*, vol. 30, no. 9, pp. 12557–12571, 2025. <https://doi.org/10.1007/s10639-024-13311-9>
- [15] J. Lee and C. LaHaye, "Unequal access to the mathematics course ladder for rural students in the southern states," *Journal of Advanced Academics*, vol. 35, no. 4, pp. 671–697, 2024. <https://doi.org/10.1177/1932202X241241355>
- [16] J. Goldstein, M. Lozano, and N. S. Panero, "Metabolizing the challenges to partnership: Partner learning in a university-district partnership for leadership preparation," *Journal of Research on Leadership Education*, vol. 20, no. 1, pp. 32–58, 2025. <https://doi.org/10.1177/19427751241245976>
- [17] S. L. Hairston and E. R. Crawford, "An educator's excess of language around latinx students of uncertain legal status: Creating visibility or invisibility?," *Educational Studies*, vol. 57, no. 4, pp. 409–428, 2021. <https://doi.org/10.1080/00131946.2021.1945605>
- [18] S. K. Patrick, "Collaborating for improvement? Goal specificity and commitment in targeted teacher partnerships," *Teachers College Record*, vol. 124, no. 1, pp. 164–190, 2022. <https://doi.org/10.1177/01614681221086104>
- [19] P. Hallinger and J. Kovačević, "A bibliometric review of research on educational administration: Science mapping the literature, 1960 to 2018," *Review of Educational Research*, vol. 89, no. 3, pp. 335–369, 2019. <https://doi.org/10.3102/0034654319830380>
- [20] A. F. Van Raan, "Sleeping beauties cited in patents: Is there also a dormitory of inventions?," *Scientometrics*, vol. 110, no. 3, pp. 1123–1156, 2017. <https://doi.org/10.1007/s11192-016-2215-8>
- [21] S. Aboagye and M. Ayikue, "A bibliometric review of research trends in educational leadership," *British Journal of Education*, vol. 13, no. 2, pp. 30–43, 2025.
- [22] C. Azorín and M. Fullan, "Leading new, deeper forms of collaborative cultures: Questions and pathways," *Journal of Educational Change*, vol. 23, no. 1, pp. 131–143, 2022. <https://doi.org/10.1007/s10833-021-09448-w>
- [23] A. Harris and M. Jones, "COVID 19—school leadership in disruptive times," *School Leadership & Management*, vol. 40, no. 4, pp. 243–247, 2020. <https://doi.org/10.1080/13632434.2020.1811479>
- [24] K. Leithwood, A. Harris, and D. Hopkins, "Seven strong claims about successful school leadership revisited," *School Leadership & Management*, vol. 40, no. 1, pp. 5–22, 2020. <https://doi.org/10.1080/13632434.2019.1596077>
- [25] M. Tian, M. Risku, and K. Collin, "A meta-analysis of distributed leadership from 2002 to 2013: Theory development, empirical evidence and future research focus," *Educational Management Administration & Leadership*, vol. 44, no. 1, pp. 146–164, 2016. <https://doi.org/10.1177/1741143214558576>
- [26] T. Bush, "Knowledge production in educational leadership and management: Broadening the base," *Educational Management Administration & Leadership*, vol. 48, no. 2, pp. 207–208, 2020.
- [27] UNESCO, *Education for sustainable development: A roadmap*. Paris, France: UNESCO, 2020.
- [28] A. L. Gillen, J. R. Grohs, H. M. Matusovich, and G. R. Kirk, "A multiple case study of an interorganizational collaboration: Exploring the first year of an industry partnership focused on middle school engineering education," *Journal of Engineering Education*, vol. 110, no. 3, pp. 545–571, 2021. <https://doi.org/10.1002/jee.20403>
- [29] A. R. Liu and R. J. Gruijters, "Losing the race before its start: inequities in early childhood development interventions in China," *Compare: A Journal of Comparative and International Education*, vol. 55, no. 5, pp. 829–848, 2025. <https://doi.org/10.1080/03057925.2024.2321863>
- [30] A. Buerkle, A. O'Dell, H. Matharu, L. Buerkle, and P. Ferreira, "Recommendations to align higher education teaching with the UN sustainability goals – A scoping survey," *International Journal of Educational Research Open*, vol. 5, p. 100280, 2023. <https://doi.org/10.1016/j.ijedro.2023.100280>
- [31] A. Schleicher, *Lessons for education from COVID-19*. Paris, France: OECD Publishing, 2020.
- [32] M. Jannah, A. A. Sarkawi, J. Othman, and K. M. Ali, "Management strategies of a productive waqf-based forest in bogor, Indonesia," *Jurnal Sylva Lestari*, vol. 12, no. 3, pp. 741–759, 2024. <https://doi.org/10.23960/jsl.v12i3.931>
- [33] M. Fullan, *The new meaning of educational change*. New York: Teachers College Press, 2016.

- [34] L. S. Vygotsky, *Mind in mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press, 1980.
- [35] S. Bachri, A. Baidowi, and M. Aliman, "Problem-based service learning's effect on environmental concern and ability to write scientific papers," *International Journal of Instruction*, vol. 13, no. 4, pp. 161-176, 2020.
- [36] S. Kaplan-Berkley, "Digital tools and streaming media converge to inspire social interactions of generation alpha," *International Journal of Early Childhood*, vol. 54, pp. 185-201, 2022. <https://doi.org/10.1007/s13158-021-00301-y>
- [37] Islahuddin, Winarti, and D. Sulisworo, "Feasibility analysis of joyful learning implementation through digital technology integration: Challenges and solutions," *Buletin Edukasi Indonesia*, vol. 4, no. 01, pp. 20-29, 2025. <https://doi.org/10.56741/bei.v4i01.842>
- [38] A. I. Kennedy, A. M. Mejía-Rodríguez, and A. Strello, "Inequality in remote learning quality during COVID-19: student perspectives and mitigating factors," *Large-scale assessments in education*, vol. 10, p. 29, 2022. <https://doi.org/10.1186/s40536-022-00143-7>
- [39] J. J. Park, Y. K. Kim, C. Salazar, and M. K. Eagan, "Racial discrimination and student-faculty interaction in STEM: Probing the mechanisms influencing inequality," *Journal of Diversity in Higher Education*, vol. 15, no. 2, pp. 218-229, 2022. <https://doi.org/10.1037/dhe0000224>
- [40] A. Portera, C. Balloi, and E. M. Salvadori, "Intersectionality in intercultural educational research. The role of power and privilege in multicultural societies," *Intercultural Education*, vol. 36, no. 4, pp. 437-457, 2025. <https://doi.org/10.1080/14675986.2025.2484705>
- [41] E. Daniëls, A. Hondeghem, and F. Dochy, "A review on leadership and leadership development in educational settings," *Educational Research Review*, vol. 27, pp. 110-125, 2019. <https://doi.org/10.1016/j.edurev.2019.02.003>
- [42] A. M. Hawkman and N. C. Murray-Everett, "Reality and rationalization: Insights on rural teachers' efforts to build racial literacy," *Educational Studies*, vol. 60, no. 2, pp. 216-233, 2024. <https://doi.org/10.1080/00131946.2024.2305769>
- [43] T. Ebuye and A. Asgedom, "Minority student's agency: resistance to inequality at multiethnic primary schools," *Cogent Education*, vol. 11, no. 1, p. 2351748, 2024. <https://doi.org/10.1080/2331186X.2024.2351748>
- [44] L. Ebersöhn, F. Omidire, and P. K. Murphy, "Academic flocking and global distress: Equitable south-north research partnering to promote quality education in diverse contexts and cultures," *Zeitschrift für Erziehungswissenschaft*, vol. 25, pp. 745-764, 2022. <https://doi.org/10.1007/s11618-022-01084-1>
- [45] M. Sianturi, J.-S. Lee, and T. M. Cumming, "Strengthening Indigenous parents' co-leadership through culturally responsive home-school partnerships: A practical implementation framework," *Pedagogy, Culture & Society*, vol. 33, no. 3, pp. 823-846, 2025. <https://doi.org/10.1080/14681366.2023.2272746>
- [46] J. C. Martin and M. Bianco, "Developing critically conscious, Latinx preservice teachers: Teaching as social justice," *The Urban Review*, vol. 57, pp. 30-50, 2025. <https://doi.org/10.1007/s11256-024-00708-6>
- [47] S. Koutsouri and A. Sarakinioti, "Working with constructs of inclusion for understanding teachers' literacy practices and their impact on student learning," *International Studies in Sociology of Education*, vol. 34, no. 2, pp. 235-257, 2025. <https://doi.org/10.1080/09620214.2024.2370474>
- [48] N. Kurian, "'Kindness isn't important, we need to be scared': Disruptions to the praxis of peace education in an Indian school," *Journal of Peace Education*, vol. 17, no. 2, pp. 186-207, 2020. <https://doi.org/10.1080/17400201.2020.1728237>
- [49] N. McDuff, A. Hughes, J. Tatam, E. Morrow, and F. Ross, "Improving equality of opportunity in higher education through the adoption of an inclusive curriculum framework," *Widening Participation & Lifelong Learning*, vol. 22, no. 2, pp. 83-121, 2020. <https://doi.org/10.5456/WPLL.22.2.83>
- [50] J. Morales-Verdejo, "Students' and teachers' social representations of the student-teacher relationships at disadvantaged secondary schools in Chile," *International Journal of Educational Research Open*, vol. 8, p. 100432, 2025. <https://doi.org/10.1016/j.ijedro.2024.100432>
- [51] S. Sarohe, "Reading the 'caste' in the minds of 'aspirant teachers'," *Contemporary Voice of Dalit*, vol. 17, no. 1, pp. 24-32, 2025. <https://doi.org/10.1177/2455328X221088446>
- [52] R. Oostdam, M. van Diepen, B. Zijlstra, and R. Fekkink, "Effects of the COVID-19 school lockdowns on language and math performance of students in elementary schools: Implications for educational practice and reducing inequality," *European Journal of Psychology of Education*, vol. 39, pp. 129-149, 2024. <https://doi.org/10.1007/s10212-023-00679-4>
- [53] A. Katsikas and T. Thanos, "Implementation of online teaching in primary schools during the first lockdown In Greece: Teachers' views," *International Electronic Journal of Elementary Education*, vol. 17, no. 4, pp. 503-517, 2025. <https://doi.org/10.26822/iejee.2025.395>
- [54] A. N. Shuilleabhain, A. Cronin, and M. Prendergast, "Maths Sparks engagement programme: investigating the impact on under-privileged pupils' attitudes towards mathematics," *Teaching Mathematics and Its Applications: International Journal of the IMA*, vol. 40, no. 1, pp. 133-153, 2021. <https://doi.org/10.1093/teamat/hraa009>
- [55] N. Rao, Y. Su, and J. Gong, "Persistent urban-rural disparities in early childhood development in China: The roles of maternal education, home learning environments, and early childhood education," *International Journal of Early Childhood*, vol. 54, pp. 445-472, 2022. <https://doi.org/10.1007/s13158-022-00326-x>

- [56] A. N. Amorim *et al.*, "Exploring the use of Escribo Play mobile learning games to foster early mathematics for low-income first-grade children," *Computers & Education*, vol. 199, p. 104759, 2023. <https://doi.org/10.1016/j.compedu.2023.104759>
- [57] S. Tikkinen and R.-L. Korkeamäki, "The paradox of collaboration in the partnership between primary schools and public libraries," *Educational Studies*, vol. 49, no. 5, pp. 730-748, 2023. <https://doi.org/10.1080/03055698.2021.1884048>
- [58] T. W. Fitzsimmons, M. S. Yates, and V. J. Callan, "Lean in? The role of single sex schools in the gendering of confidence in high school adolescents," *Australian Journal of Career Development*, vol. 30, no. 2, pp. 139-149, 2021. <https://doi.org/10.1177/10384162211012045>
- [59] B. Wong, J. DeWitt, and Y.-L. T. Chiu, "Mapping the eight dimensions of the ideal student in higher education," *Educational Review*, vol. 75, no. 2, pp. 153-171, 2023. <https://doi.org/10.1080/00131911.2021.1909538>
- [60] D. Rodriguez-Segura, C. Campton, L. Crouch, and T. S. Slade, "Looking beyond changes in averages in evaluating foundational learning: Some inequality measures," *International Journal of Educational Development*, vol. 84, p. 102411, 2021. <https://doi.org/10.1016/j.ijedudev.2021.102411>
- [61] G. Spencer and A. Stich, "College choice revisited: Socioeconomic differences in college transfer destinations among four-year college entrants," *Research in Higher Education*, vol. 64, pp. 959-986, 2023. <https://doi.org/10.1007/s11162-023-09730-1>
- [62] N. Larsen, "Teacher education and co-learning with ESD: A case study for developing ESD, co-learning, and global partnership in teacher education in Denmark," *Futures of Education, Culture and Nature-Learning to Become*, vol. 1, pp. 134-150, 2022. <https://doi.org/10.7146/fecun.v1i.130244>
- [63] S. Sider, J. Morvan, and M. Börner, "Partnerships to support quality education in Haiti: A case study addressing the Sustainable Development Goals," *Compare: A Journal of Comparative and International Education*, vol. 53, no. 4, pp. 567-584, 2023. <https://doi.org/10.1080/03057925.2021.1941771>
- [64] A. Hay and Z. Simamane, "Preservice teachers' experiences about a capacity-building activity to foster sustainability competencies through participatory action learning: a systems thinking in practice approach," *Environmental Education Research*, pp. 1-18, 2025. <https://doi.org/10.1080/13504622.2025.2543508>
- [65] A. O. Omotosho, K. Yassim, C. Uleanya, K. H. Mkwizu, and D. Mhlanga, "A bibliometric and systematic review of university-led sustainability projects worldwide: unveiling effective practices," *International Journal of Sustainability in Higher Education*, 2025. <https://doi.org/10.1108/IJSHE-01-2024-0045>
- [66] Y. Owusu-Agyeman, "Formation of a sustainable development ecosystem for Ghanaian universities," *International Review of Education*, vol. 67, pp. 333-362, 2021. <https://doi.org/10.1007/s11159-020-09857-8>
- [67] I. Žalėnienė and P. Pereira, "Higher education for sustainability: A global perspective," *Geography and Sustainability*, vol. 2, no. 2, pp. 99-106, 2021. <https://doi.org/10.1016/j.geosus.2021.05.001>
- [68] V. Martínez-Lazcano, C. I. Martínez-Alcalá, and E. A. Prieto-Barboza, "The importance of motivation in the collaborative learning process in pandemic and post-pandemic undergraduate students," in *Proceedings of the Future Technologies Conference (pp. 437-449)*. Cham: Springer Nature Switzerland, 2024.
- [69] J. Pulgar, D. Ramírez, and C. Candia, "Enhanced social connectivity in hybrid classrooms versus academic centrality in online settings," *Physical Review Physics Education Research*, vol. 19, no. 2, p. 020155, 2023. <https://doi.org/10.1103/PhysRevPhysEducRes.19.020155>
- [70] E. Sjølie, T. C. Espenes, and R. Buø, "Social interaction and agency in self-organizing student teams during their transition from face-to-face to online learning," *Computers & Education*, vol. 189, p. 104580, 2022. <https://doi.org/10.1016/j.compedu.2022.104580>
- [71] T. Törmänen, H. Järvenoja, M. Saqr, J. Malmberg, and S. Järvelä, "A person-centered approach to study students' socio-emotional interaction profiles and regulation of collaborative learning," *Frontiers in Education*, vol. 7, 2022. <https://doi.org/10.3389/feduc.2022.866612>
- [72] F. Gao, C. Wang, H. Xie, and J. Hong, "Social interaction and online learning efficiency for middle school students: The mediating role of social presence and learning engagement," *Behavioral Sciences*, vol. 14, no. 10, p. 896, 2024. <https://doi.org/10.3390/bs14100896>
- [73] T. Akita and S. Miyata, *Urban and rural dimensions of the role of education in inequality: A comparative analysis between Indonesia, Myanmar, and the Philippines*. In *Rural-Urban Dichotomies and Spatial Development in Asia*. Singapore: Springer, 2021.
- [74] G. Stahl, L. Scholes, S. McDonald, and J. Lunn, "Middle years students' engagement with science in rural and urban communities in Australia: exploring science capital, place-based knowledges and familial relationships," *Pedagogy, Culture & Society*, vol. 29, no. 1, pp. 43-60, 2021. <https://doi.org/10.1080/14681366.2019.1684351>
- [75] L. Andrade-Vargas, A. Estevao-Romeiro, M. Iriarte-Solano, V. Riofrio-Leiva, and D. Yunga-Godoy, "Teacher's perceptions, institutional challenges, and educational sustainability during Covid-19 in Ecuador," *Heliyon*, vol. 7, no. 12, p. e08596, 2021. <https://doi.org/10.1016/j.heliyon.2021.e08596>
- [76] L. Zhao, C. Cao, Y. Li, and Y. Li, "Determinants of the digital outcome divide in E-learning between rural and urban students: Empirical evidence from the COVID-19 pandemic based on capital theory," *Computers in Human Behavior*, vol. 130, p. 107177, 2022. <https://doi.org/10.1016/j.chb.2021.107177>

- [77] M. T. Sambodo *et al.*, "Towards a new approach to community-based rural development: Lesson learned from Indonesia," *Cogent Social Sciences*, vol. 9, no. 2, p. 2267741, 2023. <https://doi.org/10.1080/23311886.2023.2267741>
- [78] A. S. Munna and M. A. Kalam, "Impact of active learning strategy on the student engagement," *GNOSI: An Interdisciplinary Journal of Human Theory and Praxis*, vol. 4, no. 2, pp. 96-114, 2021.
- [79] M. L. Kelly, T. Yeigh, S. Hudson, R. Willis, and M. Lee, "Secondary teachers' perceptions of the importance of pedagogical approaches to support students' behavioural, emotional and cognitive engagement," *The Australian Educational Researcher*, vol. 50, pp. 1025-1047, 2023. <https://doi.org/10.1007/s13384-022-00540-5>
- [80] D. Yang, P. Chen, H. Wang, K. Wang, and R. Huang, "Teachers' autonomy support and student engagement: A systematic literature review of longitudinal studies," *Frontiers in Psychology*, vol. 13, p. 925955, 2022. <https://doi.org/10.3389/fpsyg.2022.925955>
- [81] C. J. Hellín, F. Calles-Esteban, A. Valledor, J. Gómez, S. Otón-Tortosa, and A. Tayebi, "Enhancing student motivation and engagement through a gamified learning environment," *Sustainability*, vol. 15, no. 19, p. 14119, 2023. <https://doi.org/10.3390/su151914119>
- [82] S. Rasool, H. Aydin, and J. Zhang, "Impacts of South Asian's culture, income, education and expectations on parental involvement in children's academic achievement," *International Journal of Comparative Education and Development*, vol. 26, no. 1, pp. 38-55, 2024. <https://doi.org/10.1108/IJCED-01-2023-0002>
- [83] K. Swargiary, "The impact of digital learning environments on cognitive, social, and emotional development in Generation Alpha children: A comparative analysis," *SSRN*, 2024. <https://doi.org/10.2139/ssrn.4904338>
- [84] M. Rahim, S. Ahmed, M. U. Tobawal, and S. Wazir, "Investigating parental involvement in Alpha Generation's digital activities," *Migration Letters*, vol. 21, no. S12, pp. 281-289, 2024.
- [85] D. Miller, "Embracing the technological metamorphosis: Envisioning higher education for generation alpha in a shifting educational landscape," *International Journal Software Engineering and Computer Science*, vol. 3, no. 2, pp. 88-96, 2023. <https://doi.org/10.35870/ijsecs.v3i2.1492>
- [86] S. A. Naidoo and N. Dasoo, "Preparing pre-service teachers for Generation Alpha: A social innovation perspective," *African Journal of Teacher Education and Development*, vol. 3, no. 1, p. 62, 2024. https://hdl.handle.net/10520/ejc-ajoted_v3_n1_a62
- [87] D. Oktay and M. C. Acaralp, *Leadership approach for generation alpha and a greener future: The health professionals of tomorrow. In Generation Alpha and Next Generation Leadership for Greener Futures*. Hershey, PA: IGI Global Scientific Publishing, 2025.
- [88] D. R. Garrison, T. Anderson, and W. Archer, "The first decade of the community of inquiry framework: A retrospective," *The Internet and Higher Education*, vol. 13, no. 1-2, pp. 5-9, 2010. <https://doi.org/10.1016/j.iheduc.2009.10.003>
- [89] F. Cimene *et al.*, "Generation alpha students' behavior as digital natives and their learning engagement," *Psychology and Education: A Multidisciplinary Journal*, vol. 27, no. 3, pp. 258-273, 2024. <https://doi.org/10.5281/zenodo.14007254>
- [90] K. L. Ødegaard and A. E. Gunnulfsen, "Policy pressure on partnerships: Intentions, expectations and legitimisation of Norwegian educational reform policy," *Journal of Educational Administration and History*, vol. 56, no. 2, pp. 220-240, 2024. <https://doi.org/10.1080/00220620.2023.2236962>
- [91] C. McConnell, "Igniting social pedagogy through learning and teaching partnerships in a higher education context," *International Journal of Social Pedagogy*, vol. 12, no. 1, p. Article 9, 2023. <https://doi.org/10.14324/111.444.ijsp.2023.v12.x.009>