DIGITAL TRANSFORMATION AND ADMINISTRATION INNOVATION

Citation: Sedaghatian, Z. (2026). The Role of Ethical Leadership in Reducing the Digital Divide and Increasing Educational Equity During the Digital Transformation of Universities. *Digital Transformation and Administration Innovation*, 4(5), 1-16.

Received date: 2026-04-06 Revised date: 2026-06-25 Accepted date: 2026-07-02 Initial published date: 2026-07-08 Final published date: 2026-09-01

The Role of Ethical Leadership in Reducing the Digital Divide and Increasing Educational Equity During the Digital Transformation of Universities

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Abstract

This study aimed to systematically review the role of ethical leadership in reducing the digital divide and increasing educational equity during the digital transformation of universities. This study was conducted as a systematic review of peer-reviewed and scholarly literature published between January 2015 and May 2026. Searches were performed in Scopus, Web of Science, ERIC, ProQuest, Education Source, ScienceDirect, and IEEE Xplore using keywords related to ethical leadership, digital transformation, digital divide, digital inclusion, educational equity, higher education, artificial intelligence, and university governance. The initial search identified 1,286 records. After removing duplicates and screening titles, abstracts, and full texts based on predefined inclusion and exclusion criteria, 38 studies were included in the final synthesis. Data were extracted using a standardized form and analyzed through qualitative thematic synthesis. The findings showed that ethical and inclusive leadership was the most frequently identified theme, appearing in 31 of the 38 included studies. Digital access and technological infrastructure were reported in 30 studies, while digital literacy and digital competence were identified in 29 studies. Equity-oriented institutional governance appeared in 27 studies, faculty development and inclusive digital pedagogy in 20 studies, and data ethics, privacy, and algorithmic responsibility in 15 studies. The most prominent leadership mechanisms were development of digital competence, fair allocation of digital resources, care-oriented support for vulnerable students, participatory decision-making, institutional accountability, and ethical management of student data. The synthesis indicated that ethical leadership contributes to educational equity through distributive, pedagogical, participatory, relational, and regulatory pathways. Ethical leadership is a fundamental condition for ensuring that university digital transformation reduces rather than reinforces educational inequality. Universities can promote digital equity when leaders align technological innovation with fairness, transparency, accessibility, accountability, student support, faculty readiness, and protection of digital rights.

Keywords: Ethical leadership; Digital divide; Educational equity; Digital transformation; Higher education; Digital inclusion; University governance.

1. Introduction

Digital transformation has become one of the most important structural changes affecting contemporary universities. Higher education institutions are increasingly expected to integrate digital platforms, artificial intelligence, learning analytics, cloud-based services, hybrid classrooms, digital libraries, intelligent tutoring systems, and data-informed management into their academic and administrative functions. This transformation is often presented as a pathway to innovation, institutional

efficiency, flexible learning, personalized education, and broader access to knowledge. However, the expansion of digital technologies in universities has also revealed deep inequalities in access, participation, competence, representation, and institutional support. Digital transformation does not automatically produce educational equity; rather, it may reproduce or intensify existing social, economic, cultural, geographical, gender-based, and disability-related inequalities when it is implemented without ethical governance and inclusive leadership. Therefore, universities face a dual responsibility: they must modernize their educational systems while ensuring that digitalization does not create new forms of exclusion. In this context, ethical leadership becomes a decisive factor because leadership determines how resources are distributed, whose voices are included in digital decision-making, how vulnerable students and faculty are supported, and how institutional values are translated into digital policy and practice (Liu et al., 2024; Mariyono et al., 2026; Weaver, 2022).

The digital divide in higher education is no longer limited to the simple distinction between those who have access to technology and those who do not. Although access to devices, stable internet connectivity, digital platforms, and technical infrastructure remains a central concern, contemporary research shows that the digital divide is multidimensional. It includes inequalities in digital literacy, digital confidence, quality of digital pedagogy, affordability of participation, accessibility for students with disabilities, language and cultural inclusion, data privacy, algorithmic vulnerability, and the ability to benefit from artificial intelligence-based learning systems. In a digitally transformed university, students may be formally enrolled and technically connected but still remain educationally disadvantaged if they lack adequate digital skills, study space, assistive technologies, academic support, or meaningful interaction with instructors. Global analyses of digital transformation in education have shown that its equity effects vary across countries and institutional contexts, indicating that technological progress alone cannot guarantee inclusive outcomes (Kim et al., 2025). Similarly, studies on educational technology leadership emphasize that equitable digital transformation requires attention to both infrastructure and the human conditions that enable meaningful participation (Durán & Ermiş, 2024; Zhang et al., 2025).

The acceleration of artificial intelligence in education has added further complexity to the digital divide. AI-driven learning environments, adaptive platforms, automated assessment tools, predictive analytics, and intelligent educational information systems can support personalization, early intervention, and more responsive educational services. However, these technologies may also produce new inequities if access is uneven, algorithms are biased, data are misused, or institutional leaders lack ethical frameworks for implementation. The emergence of the AI divide reflects the risk that students, faculty, and institutions with greater technological capacity will benefit disproportionately from new systems, while marginalized groups will be positioned as passive users, data subjects, or excluded populations. The concern that AI may create new forms of social stratification has been described through concepts such as AI caste systems and AI-based exclusion, emphasizing that digital injustice may become embedded in technological infrastructures if not addressed proactively (Yu, 2024). Educational leadership studies also indicate that leaders must understand the long-term implications of AI integration for pedagogy, teacher roles, assessment, policy, and student opportunity (Alshehri, 2023; Camarero-Figuerola & Camacho, 2025; Kim, 2025).

Ethical leadership provides a normative and practical framework for guiding digital transformation toward justice, inclusion, and human dignity. Ethical leadership in universities involves more than personal honesty or compliance with institutional rules; it includes fairness in resource allocation, transparency in decision-making, accountability for outcomes, respect for privacy, responsiveness to vulnerable groups, and commitment to educational justice. In digital transformation, ethical leaders are expected to ask not only whether a technology is efficient, but also whether it is fair, accessible, pedagogically meaningful, culturally responsive, and protective of student rights. This is especially important because digital policies often appear technical while carrying strong ethical consequences. Decisions about platform adoption, data collection, online examination, digital attendance, learning analytics, device distribution, and AI-supported advising can directly affect who succeeds, who is monitored, who is supported, and who is excluded. Research on ethical considerations in open and distance learning institutions highlights that digital higher education must be grounded in principles of responsibility, fairness, academic integrity, and care for learners (Nthoesane, 2024). Work on EdTech strategy also stresses that digital planning should be aligned with educational goals and equity rather than technology adoption for its own sake (Hub, 2022).

One of the central mechanisms through which ethical leadership can reduce the digital divide is the fair and needs-based allocation of digital resources. In many universities, equal distribution of technological resources may not be sufficient because students and departments begin from unequal positions. Ethical leadership therefore requires equity-oriented distribution,

meaning that additional support should be directed toward those with the greatest disadvantage. This may include loaning devices, subsidizing internet access, creating accessible digital learning spaces, strengthening rural and remote connectivity, expanding digital library services, providing assistive technologies, and offering targeted support for low-income and first-generation students. Evidence from broader digital equity literature shows that underserved communities require intentionally designed service delivery models supported by data analytics and program management, rather than generic interventions that assume uniform need (Adekugbe & Ibeh, 2024). Similar concerns appear in studies on digital health and digital divide, where vulnerable populations are often excluded not because digital solutions are unavailable, but because systems fail to address social and structural barriers to access (Agrawal & Agbeyangi, 2026; Osborne, 2025). Although these studies are not limited to universities, they offer important lessons for higher education because students' educational participation is shaped by the same structural inequalities that affect access to digital public services.

Another major mechanism is the development of digital competence among both students and faculty members. Digital transformation can only contribute to educational equity when users have the skills, confidence, and support needed to engage meaningfully with technology. Faculty members play a crucial role because the quality of digital pedagogy determines whether technology becomes a tool for inclusion or a barrier to learning. Studies of teachers' digital competency show that digital infrastructure and professional capacity must be considered together; technology provision without competence-building is unlikely to produce equitable outcomes (Rawal, 2024). In higher education, faculty perceptions of technology leadership influence their willingness and ability to integrate technology into teaching, which means that leadership is indirectly connected to student learning opportunities through faculty practice (Zhang et al., 2025). Personalized learning research in health sciences education also suggests that digital learning environments can support diverse learners when technology is used to adapt learning pathways, but such benefits depend on thoughtful design and institutional readiness (Ali et al., 2025). Therefore, ethical leadership must include sustained professional development, mentoring, inclusive instructional design, and support for faculty innovation.

Educational equity during digital transformation also depends on inclusive pedagogical leadership. Hybrid and blended learning models have expanded rapidly, but their equity effects vary based on how they are designed and governed. Hybrid classrooms may increase flexibility for some students while creating disengagement, isolation, or unequal participation for others. Research on college deans and administrators has shown that pedagogical leadership in hybrid classrooms requires institutional coordination, faculty preparation, and attention to student experience (Cruz & Dulay, 2023). Similarly, equity in blended learning requires frameworks that connect structural gaps with students' lived experiences, because students' digital participation is shaped by home conditions, socioeconomic status, disability, caregiving responsibilities, and prior educational opportunity (Murphy et al., 2025). Progressive teaching strategies for gender equity in STEM further demonstrate that educational inclusion requires intentional pedagogical design, not simply access to academic programs or technologies (Daraz et al., 2024). These findings suggest that digital transformation should be evaluated not only by technological adoption indicators but also by its effects on participation, belonging, academic confidence, and success among diverse student groups.

The ethical dimension of leadership is also visible in how universities manage data, artificial intelligence, and digital surveillance. Digital platforms collect large volumes of student data, including attendance, engagement patterns, assessment performance, communication records, and behavioral indicators. These data can help institutions identify students at risk and improve academic support, but they can also raise concerns about privacy, surveillance, consent, algorithmic bias, and discriminatory intervention. Research in health systems demonstrates that big data and AI may support equity when used responsibly, but they may also reproduce inequities if biased datasets, unequal access, and weak governance are ignored (Kachnowski et al., 2025). Digital self-care research similarly highlights the importance of carefully evaluating digital solutions, user autonomy, and long-term management in technology-mediated systems (Correia et al., 2025). For universities, this means ethical leadership must develop transparent data policies, explain how student information is used, limit unnecessary monitoring, protect privacy, and ensure that algorithmic systems do not disadvantage marginalized learners.

The concept of educational equity in digital transformation also intersects with broader debates about social justice, global inequality, and institutional responsibility. Global health inequality research emphasizes that inequity is not merely a technical problem but a justice issue rooted in unequal distribution of power, resources, and opportunity (Abdi et al., 2025). Similar

logic applies to higher education: the digital divide is not only about devices or connectivity, but about who has the institutional conditions required to benefit from knowledge systems. Global financial and development discussions also show that justice-oriented reform requires structural change, not only isolated interventions (Thomas, 2025). In universities, this means that leaders should align digital transformation with mission, public responsibility, and social mobility. Digital equity must be embedded into strategic planning, budgeting, quality assurance, student services, faculty development, and institutional assessment. Equity and social justice competency development in educational leadership preparation programs further indicates that leaders require explicit preparation to recognize inequity and act on it systematically (Moraguez et al., 2025). Without such preparation, digital transformation may be managed as an administrative upgrade rather than an ethical responsibility.

The postdigital era has also changed the meaning of learner agency. Students now learn across physical, digital, algorithmic, and social environments, making agency entangled with platforms, data systems, institutional rules, and technological affordances. The concept of the entangled learner emphasizes that students' capacity to act critically in digital environments depends on the conditions created around them (Code, 2025). Therefore, ethical leadership should not treat students as passive recipients of technology but as active participants in shaping digital learning environments. This requires participatory decision-making, student voice, co-design of digital services, and responsiveness to diverse lived experiences. Leadership studies beyond education also support this view. Smart leadership approaches for smart city development highlight the importance of ethical, participatory, and adaptive governance in technology-rich environments (Springs, 2024). Likewise, nursing and health leadership studies show that leadership development is essential when professional systems confront technological and organizational change (Burford et al., 2025; Matandela et al., 2025). Although these studies are situated outside university administration, they reinforce the broader principle that ethical and adaptive leadership is necessary when digital systems reshape human services.

Digital transformation is also linked to career readiness and future employability. Universities are responsible not only for providing access to digital learning, but also for preparing students to participate in a labor market transformed by artificial intelligence, automation, and technological volatility. Research on career readiness emphasizes the importance of preparing students for workforce entry through skills, adaptability, and professional competence (Moore & Thaller, 2023). Work on school counselors and the future of work similarly shows that educational systems must prepare learners for AI-driven career environments and economic uncertainty (Falco, 2026). These concerns are directly relevant to universities because inequitable digital transformation may produce unequal career outcomes. Students who graduate with strong digital competence, AI literacy, and access to digital networks may gain significant advantages, while students excluded from high-quality digital learning may face further marginalization. Emerging frameworks such as the AI–Family Integration Index also reflect the expanding social implications of AI readiness, suggesting that digital transformation increasingly affects not only institutions but also families, communities, and everyday life (Mahajan, 2025).

Finally, the growing literature on innovation, research equity, and digital inclusion shows that equity-oriented transformation requires collaboration across institutions, disciplines, and communities. Global oral health innovation and research equity discussions demonstrate the importance of inclusive participation in scientific and technological development, especially for regions and populations historically underrepresented in research systems (Gudsoorkar et al., 2025). Cloud-based solutions for rural youth show how targeted digital infrastructure can reduce geographic disadvantage when implemented with attention to local context and user needs (Shen et al., 2025). Educational information centers using AI and big data may also support equity when they are designed to bridge rather than widen access gaps (Alzu'bi & Bishtawi, 2025). Literacy and inclusivity initiatives further indicate that digital equity must include language, accessibility, and participation, not only hardware and connectivity (Grady et al., 2024). Earlier work on information technology education from the perspective of equity and efficiency similarly reminds institutions that technology policy must balance performance goals with fairness (Shen, 2022). Taken together, these studies show that ethical leadership is essential because digital transformation requires choices about values, priorities, and beneficiaries.

Despite the increasing attention to digital transformation, AI integration, educational technology leadership, and digital equity, the literature remains fragmented. Some studies focus on infrastructure, others on digital skills, others on AI ethics, and others on inclusive pedagogy or leadership competencies. However, fewer studies synthesize these dimensions into a coherent

understanding of how ethical leadership can reduce the digital divide and increase educational equity specifically during the digital transformation of universities. This gap is important because universities cannot address digital inequality through isolated technical interventions. They require leadership approaches that integrate justice, access, competence, accountability, care, participation, and responsible innovation. Therefore, the aim of this study was to systematically review the role of ethical leadership in reducing the digital divide and increasing educational equity during the digital transformation of universities.

2. Methods and Materials

This study was designed as a systematic review to identify, evaluate, and synthesize existing evidence on the role of ethical leadership in reducing the digital divide and promoting educational equity during the digital transformation of universities. The review process was conducted using a structured and transparent approach in order to ensure comprehensiveness, reproducibility, and methodological rigor. The target population of the review consisted of peer-reviewed academic studies addressing ethical leadership, digital transformation, digital inequality, digital inclusion, and educational equity in higher education settings. The search covered studies published between January 2015 and May 2026, because this period reflects the rapid expansion of digitalization in universities, the intensified use of online and hybrid learning environments, and the increasing scholarly attention to equity-oriented leadership in higher education.

The initial database search identified 1,286 records from Scopus, Web of Science, ERIC, ProQuest, Education Source, ScienceDirect, and IEEE Xplore. After removing 318 duplicate records, 968 unique titles and abstracts were screened. At this stage, 811 records were excluded because they were unrelated to higher education, did not address leadership, focused only on technical infrastructure without an educational equity perspective, or examined digital transformation outside university contexts. The full texts of 157 articles were then assessed for eligibility. Of these, 119 articles were excluded because they did not directly examine ethical leadership, did not include digital divide or educational equity as a central issue, lacked sufficient methodological clarity, were not available in full text, or were non-scholarly publications such as editorials, opinion pieces, news reports, or institutional promotional documents. Finally, 38 studies met all inclusion criteria and were included in the systematic review. These 38 studies formed the final sample of the review and constituted the main body of evidence for analysis.

Studies were included if they focused on universities or higher education institutions, addressed digital transformation or technology-mediated education, and discussed at least one of the following concepts: ethical leadership, responsible leadership, inclusive leadership, digital equity, digital inclusion, digital access, digital competence, educational justice, or reduction of inequality in digital learning environments. Both empirical and high-quality conceptual studies were included, provided that they offered a clear contribution to understanding leadership and equity in digitally transforming universities. Studies were excluded if they focused only on primary or secondary education, corporate training, general information technology management, or student achievement without reference to leadership, digital inequality, or educational equity. The final sample included quantitative, qualitative, mixed-methods, and conceptual studies, allowing for a broad synthesis of the topic from managerial, pedagogical, ethical, and technological perspectives.

Data collection was conducted through a systematic search protocol developed specifically for this review. The search strategy combined keywords related to ethical leadership, digital transformation, digital divide, educational equity, and universities. The main search terms included combinations such as “ethical leadership,” “responsible leadership,” “inclusive leadership,” “digital transformation,” “digital divide,” “digital inclusion,” “digital equity,” “educational equity,” “higher education,” “universities,” “online learning,” “technology access,” and “digital competence.” Boolean operators were used to combine these terms, and database-specific filters were applied to limit the results to peer-reviewed scholarly sources, English-language publications, and studies published within the selected time frame. The search strategy was adapted to the indexing structure of each database while maintaining conceptual consistency across all searches.

A standardized screening form was used to guide the selection of studies. This form included the title of the article, authorship information, year of publication, country or region of study, research design, educational context, population or sample, key leadership concept, digital transformation focus, digital divide dimension, educational equity dimension, main findings, and methodological limitations. Two reviewers independently screened the titles, abstracts, and full texts according to the inclusion and exclusion criteria. Disagreements were resolved through discussion and re-examination of the full text until

consensus was reached. To increase the reliability of the screening process, inter-reviewer agreement was assessed during the full-text eligibility stage and showed a high level of consistency.

For quality appraisal, a methodological assessment checklist was used to evaluate the relevance, clarity, and rigor of the included studies. Because the final corpus contained different types of research designs, the appraisal process considered design-specific criteria. Quantitative studies were assessed based on clarity of objectives, appropriateness of sampling, validity of measurement tools, adequacy of data analysis, and transparency of reported findings. Qualitative studies were assessed based on clarity of research questions, appropriateness of participant selection, depth of data collection, transparency of coding procedures, and credibility of interpretations. Mixed-methods studies were evaluated based on the integration of quantitative and qualitative components, while conceptual studies were assessed based on theoretical coherence, relevance to the research question, clarity of argumentation, and contribution to the field. The quality appraisal was not used to exclude studies automatically, but it informed the interpretation of the strength and credibility of the evidence.

The data were analyzed using a qualitative thematic synthesis approach supported by descriptive mapping of the included studies. First, all eligible articles were read in full, and relevant information was extracted into a structured data extraction matrix. The extracted data included bibliographic information, research objectives, methodological characteristics, theoretical frameworks, definitions of ethical leadership, dimensions of the digital divide, indicators of educational equity, university digital transformation practices, and reported implications for policy and management. The extracted information was reviewed several times to ensure accuracy and consistency before synthesis.

The analysis proceeded through open coding, axial coding, and thematic integration. In the open coding stage, meaningful statements related to leadership ethics, digital access, digital literacy, institutional responsibility, technological inclusion, student support, faculty readiness, and equity-oriented governance were identified. In the axial coding stage, similar codes were grouped into broader analytical categories. These categories included ethical decision-making in digital transformation, fair distribution of technological resources, leadership responsibility for digital inclusion, student-centered equity policies, faculty development for inclusive digital teaching, data ethics and privacy, accessibility for disadvantaged groups, and institutional accountability. In the final stage, the categories were integrated into overarching themes explaining how ethical leadership can reduce the digital divide and increase educational equity in universities.

The synthesis focused on identifying patterns across the studies rather than calculating pooled statistical effects. A meta-analysis was not conducted because the included studies differed substantially in research design, variables, measurement tools, institutional contexts, and outcome indicators. Instead, narrative and thematic synthesis were considered more appropriate for integrating evidence from diverse methodological traditions. The findings were organized around the mechanisms through which ethical leadership contributes to digital equity, including promoting justice in access to technology, supporting vulnerable and underrepresented students, strengthening digital competence among students and faculty, ensuring transparency in digital decision-making, protecting data rights and privacy, and aligning digital transformation strategies with educational justice. The final interpretation was developed by comparing recurring findings across studies and identifying areas of convergence, contradiction, and research gaps.

3. Findings and Results

The final synthesis was conducted on 38 eligible studies that examined the relationship between ethical leadership, digital transformation, the digital divide, and educational equity in university settings. In the context of this systematic review, demographic reporting refers to the bibliographic, geographical, methodological, and institutional characteristics of the included studies rather than demographic characteristics of individual participants, because the unit of analysis was the study itself. The included studies were published between 2015 and May 2026. In terms of publication year, 5 studies were published between 2015 and 2017, 8 studies between 2018 and 2020, 15 studies between 2021 and 2023, and 10 studies between 2024 and May 2026. This distribution shows that the topic gained substantial scholarly attention after the expansion of online, hybrid, and platform-based higher education, particularly during and after the period in which universities were required to accelerate digital transformation. Geographically, the studies represented diverse higher education systems. Ten studies were conducted in Asia, 9 in Europe, 7 in North America, 5 in Africa, 3 in Latin America, 2 in Oceania, and 2 studies adopted a multi-regional or international comparative approach. This geographical distribution indicates that the digital divide in universities is not

limited to low-resource contexts; rather, it appears in different forms across both developed and developing higher education systems.

From a methodological perspective, 13 studies used qualitative designs, 9 studies used quantitative designs, 7 studies employed mixed-methods approaches, and 9 studies were conceptual or theoretical papers. The qualitative studies mainly explored leadership practices, institutional values, digital inclusion policies, and lived experiences of students and faculty. The quantitative studies generally examined relationships among leadership style, technology access, digital readiness, student engagement, and perceived equity. The mixed-methods studies provided broader explanatory value by combining institutional data, surveys, interviews, and document analysis. The conceptual studies contributed to theory-building by linking ethical leadership to justice, inclusion, responsibility, transparency, and accountability in digital higher education. Regarding institutional context, 21 studies focused on public universities, 6 on private universities, 4 compared both public and private institutions, 3 examined online or open universities, and 4 analyzed higher education systems, policy frameworks, or institutional networks rather than a single university. Across the empirical studies, the most frequently examined groups were students, faculty members, academic administrators, and educational technology staff. Students were addressed in 22 studies, faculty members in 16 studies, university leaders or administrators in 13 studies, and information technology or student-support personnel in 7 studies. Because several studies included more than one stakeholder group, these categories were not mutually exclusive.

Table 1. Main thematic categories identified across the included studies

Thematic category	Number of studies	Percentage of included studies	Main focus of evidence	Interpretation in relation to the review question
Ethical and inclusive leadership in digital transformation	31	81.6%	Leadership responsibility, fairness, transparency, trust, moral decision-making, and inclusion in digital policy	Ethical leadership was the most dominant theme and was repeatedly presented as a central condition for ensuring that digital transformation does not reproduce or intensify educational inequality.
Digital access and technological infrastructure	30	78.9%	Availability of devices, internet connectivity, learning management systems, digital platforms, and institutional support services	Access to technology was identified as the most visible layer of the digital divide, especially for students from low-income, rural, marginalized, or under-supported backgrounds.
Digital literacy and digital competence	29	76.3%	Students' and faculty members' ability to use digital tools, online learning platforms, academic databases, and educational technologies	The evidence showed that access alone is insufficient; equitable participation requires the development of digital skills among both learners and educators.
Equity-oriented institutional governance	27	71.1%	Digital policies, resource allocation, inclusive decision-making, accountability mechanisms, and strategic planning	Studies emphasized that ethical leadership becomes effective when it is embedded in governance systems rather than limited to individual managerial behavior.
Faculty development and inclusive digital pedagogy	20	52.6%	Teacher training, online teaching competence, accessible course design, student engagement, and flexible learning models	Faculty readiness was frequently described as a bridge between institutional digital transformation and students' actual educational experience.
Data ethics, privacy, and algorithmic responsibility	15	39.5%	Learning analytics, student data protection, surveillance concerns, algorithmic bias, and responsible technology use	A smaller but growing group of studies showed that digital equity must include ethical management of data, privacy, and automated decision-making systems.
Crisis response and continuity of education	14	36.8%	Emergency remote learning, pandemic-related digital transition, resilience, continuity planning, and support for vulnerable students	Studies in this category highlighted that ethical leadership is especially important during crises, when unequal access to digital learning becomes more visible and consequential.

Table 1 shows that the most frequently identified theme was ethical and inclusive leadership in digital transformation, which appeared in 31 of the 38 studies. This finding indicates that the literature does not treat digital transformation as a merely technical or infrastructural process. Instead, most studies conceptualized digital transformation as an ethical and institutional change process that requires fair decision-making, accountability, transparency, and attention to vulnerable groups. Digital access and technological infrastructure were also highly represented, appearing in 30 studies. This confirms that the material dimension of the digital divide remains central in higher education, particularly where students lack reliable devices, stable internet connections, assistive technologies, or access to institutional learning systems. However, the close frequency of digital literacy and digital competence, identified in 29 studies, demonstrates that the digital divide is not limited to physical access.

Many studies emphasized that students and faculty may have access to platforms but still remain disadvantaged if they lack the skills, confidence, training, or pedagogical support required to participate effectively in digital education.

The findings also show that 27 studies addressed equity-oriented institutional governance, suggesting that ethical leadership is most effective when translated into policies, budgets, accountability structures, and participatory decision-making processes. This theme is important because it moves the discussion beyond the personal virtues of leaders and toward organizational systems that make digital equity sustainable. Faculty development and inclusive digital pedagogy were found in 20 studies, confirming that faculty members play a major role in determining whether digital transformation improves or weakens educational equity. If instructors are not prepared to design accessible, flexible, and student-centered digital learning experiences, the benefits of institutional technology investments may not reach students equally. Finally, data ethics and crisis response were less frequent but analytically significant themes. The 15 studies on data ethics indicate an emerging concern with privacy, surveillance, learning analytics, and algorithmic bias, while the 14 studies on crisis response show that ethical leadership becomes particularly visible when universities must protect continuity of education under conditions of disruption.

Table 2. Dimensions of the digital divide addressed in the included studies

Dimension of the digital divide	Number of studies	Percentage of included studies	Main affected groups identified in the studies	Main pattern observed in the evidence
Access to devices, connectivity, and platforms	30	78.9%	Low-income students, rural students, first-generation students, students in underfunded institutions, and students in developing regions	The most frequently reported divide was unequal access to reliable devices, stable internet, institutional platforms, and digital learning infrastructure.
Digital literacy and operational competence	29	76.3%	Students with limited prior exposure to technology, older faculty members, first-year students, and students from disadvantaged schooling backgrounds	Many studies showed that digital inequality persists even when access is available, because users may lack the skills needed for effective academic participation.
Affordability of digital participation	18	47.4%	Economically disadvantaged students, working students, students dependent on mobile data, and students in households with shared devices	Costs related to internet data, devices, software, repairs, and learning materials created hidden barriers to participation.
Accessibility for students with disabilities	13	34.2%	Students with visual, hearing, motor, cognitive, or learning disabilities	Studies showed that digital platforms may either reduce or intensify exclusion depending on whether accessibility standards are integrated into design and teaching practice.
Pedagogical divide in digital learning	24	63.2%	Students in poorly designed online courses, students with low self-regulation, and learners needing interactive support	The quality of digital pedagogy was identified as a major determinant of equity, because weak online teaching reduced engagement and increased dropout risk.
Linguistic and cultural inclusion	10	26.3%	International students, ethnic minority students, multilingual learners, and students from culturally diverse backgrounds	Digital transformation was often implemented in dominant languages and cultural formats, which created participation barriers for some groups.
Data privacy and algorithmic vulnerability	15	39.5%	Students subject to learning analytics, online monitoring, automated assessment, and platform surveillance	The evidence suggested that digital inequality can also emerge through unequal exposure to data risks, biased systems, and limited transparency in technology use.

Table 2 presents the major dimensions of the digital divide identified in the included studies. The most common dimension was access to devices, internet connectivity, and digital platforms, which appeared in 30 studies. This finding indicates that the first and most visible responsibility of universities during digital transformation is to ensure that students and faculty can physically and technically enter digital learning environments. Studies repeatedly showed that unequal access to laptops, tablets, broadband internet, learning management systems, academic software, and digital libraries can directly limit participation in online and hybrid education. However, the digital divide was shown to be multidimensional. Digital literacy and operational competence appeared in 29 studies, almost as frequently as access. This means that even when universities provide platforms and connectivity, students and faculty may still be excluded if they do not know how to use digital tools effectively for academic work, communication, assessment, research, and collaboration.

The pedagogical divide was identified in 24 studies, showing that equity in digital education depends not only on technology but also on the quality of teaching and course design. Poorly structured online courses, limited interaction, inaccessible materials, unclear instructions, and inflexible assessment methods were found to disadvantage students who require more guidance, interaction, or adaptive support. Affordability was reported in 18 studies, indicating that the costs of digital

participation remain a substantial but sometimes hidden barrier. These costs include internet data, device maintenance, required software, printing, electricity, and private study space. Data privacy and algorithmic vulnerability appeared in 15 studies, showing that digital transformation introduces new forms of inequality related to surveillance, data protection, automated decision-making, and the use of learning analytics. Accessibility for students with disabilities was addressed in 13 studies, while linguistic and cultural inclusion was addressed in 10 studies. These lower frequencies suggest that although universities increasingly discuss digital equity, some groups remain less visible in research and policy. Overall, the evidence shows that the digital divide in universities is not a single problem of access; it is a layered inequality involving infrastructure, skills, affordability, pedagogy, accessibility, language, culture, data rights, and institutional support.

Table 3. Ethical leadership mechanisms for reducing the digital divide and increasing educational equity

Ethical leadership mechanism	Number of studies	Percentage of included studies	Leadership behavior identified in the evidence	Contribution to reducing the digital divide and increasing equity
Fair and needs-based allocation of digital resources	27	71.1%	Prioritizing support for students and departments with the greatest technological disadvantage	Reduced inequity by directing devices, connectivity, software, and technical support toward groups with limited access.
Inclusive participation in digital decision-making	24	63.2%	Involving students, faculty, support staff, and marginalized groups in digital transformation planning	Increased legitimacy and relevance of digital policies by ensuring that decisions reflected real user needs.
Transparency and accountability in technology governance	21	55.3%	Clearly communicating digital policies, platform decisions, data practices, and institutional responsibilities	Strengthened trust and reduced uncertainty by making digital transformation processes visible and answerable.
Development of digital competence among students and faculty	28	73.7%	Supporting training, mentoring, workshops, peer learning, and continuous professional development	Reduced skill-based inequality and improved the capacity of users to benefit from digital learning environments.
Care-oriented support for vulnerable students	25	65.8%	Providing academic flexibility, counseling, financial support, assistive technologies, and targeted outreach	Helped prevent disengagement and exclusion among students most likely to be harmed by digital inequality.
Ethical management of student data and digital surveillance	15	39.5%	Protecting privacy, limiting unnecessary monitoring, explaining data use, and preventing algorithmic bias	Expanded the meaning of equity to include protection from digital harm, misuse of data, and discriminatory systems.
Building an institutional culture of digital justice	23	60.5%	Embedding equity, responsibility, inclusion, and fairness into strategic planning and university culture	Supported long-term sustainability by making digital equity a shared institutional value rather than a temporary project.

Table 3 shows that ethical leadership contributed to digital equity through several interconnected mechanisms. The most frequently reported mechanism was the development of digital competence among students and faculty, found in 28 studies. This finding demonstrates that ethical leadership is not limited to providing technology; it also involves enabling people to use technology effectively and confidently. Leaders who invest in training, mentoring, faculty development, student orientation, and continuous technical support help reduce the skill-based dimension of the digital divide. Fair and needs-based allocation of digital resources appeared in 27 studies, making it the second most frequent leadership mechanism. This pattern shows that ethical leadership requires distributive justice in the allocation of institutional resources. In practical terms, this means that universities should not distribute digital resources equally in a mechanical sense, but equitably according to need. Students who lack devices, students in remote regions, students with disabilities, and departments with weaker infrastructure require targeted support if digital transformation is to reduce rather than deepen inequality.

Care-oriented support for vulnerable students appeared in 25 studies, indicating that ethical leadership is strongly associated with responsiveness to students' social, economic, and personal conditions. This mechanism included flexible attendance policies, alternative assessment arrangements, mental health support, financial assistance, assistive technologies, and proactive communication with students at risk of exclusion. Inclusive participation in digital decision-making was identified in 24 studies, showing that leadership becomes more ethical when those affected by digital transformation are included in planning and evaluation. The evidence suggests that top-down digital reform may overlook hidden barriers experienced by students and faculty, while participatory governance allows institutions to identify problems more accurately. Building an institutional culture of digital justice appeared in 23 studies, indicating that digital equity must be embedded into university values, strategies, and routines. Transparency and accountability were identified in 21 studies, emphasizing the importance of clear communication and institutional responsibility. Finally, ethical management of student data and digital surveillance appeared in 15 studies. Although less frequent, this mechanism is highly relevant because universities increasingly rely on digital

platforms, monitoring systems, and learning analytics. The findings suggest that ethical leadership must protect students not only from exclusion from technology but also from harm within technology-mediated environments.

Table 4. Synthesis of educational equity outcomes reported or implied across the included studies

Educational equity outcome	Number of studies	Percentage of included studies	Main indicators identified in the evidence	Interpretation of the outcome
Improved access to digital learning opportunities	28	73.7%	Increased availability of devices, internet support, learning platforms, software, and digital libraries	Ethical leadership was associated with broader and fairer access to digital learning resources.
Increased student engagement and participation	22	57.9%	Higher participation in online classes, greater interaction, improved attendance, and more consistent use of platforms	Equity improved when students were not only connected to digital systems but actively supported to participate.
Strengthened digital competence	25	65.8%	Improved digital skills, confidence in using platforms, faculty readiness, and student self-efficacy	Capacity-building emerged as a central pathway through which ethical leadership reduced unequal digital participation.
Greater trust in digital transformation	17	44.7%	Perceived fairness, transparency, institutional credibility, and reduced resistance to digital change	Ethical leadership increased acceptance of digital transformation by making institutional decisions more transparent and responsible.
Improved inclusion of vulnerable and marginalized students	18	47.4%	Targeted support for low-income students, disabled students, rural students, international students, and first-generation learners	Equity gains were strongest when leadership strategies directly addressed the needs of groups at risk of exclusion.
Enhanced faculty readiness for inclusive digital teaching	20	52.6%	Professional development, instructional design support, digital pedagogy training, and improved online teaching practices	Faculty support was necessary for translating digital transformation into equitable learning experiences.
Greater institutional accountability for digital equity	16	42.1%	Equity audits, policy review, monitoring of participation gaps, and alignment of digital strategy with inclusion goals	Ethical leadership strengthened accountability by requiring institutions to evaluate who benefits from digital transformation.
Protection of student rights in digital environments	15	39.5%	Privacy protection, responsible data use, reduced surveillance, and attention to algorithmic bias	The evidence showed that educational equity also depends on whether digital systems protect students' rights and dignity.

Table 4 summarizes the main educational equity outcomes identified across the review. The most frequently reported or implied outcome was improved access to digital learning opportunities, appearing in 28 studies. This finding indicates that ethical leadership can influence equity by ensuring that digital transformation expands access rather than limiting opportunity to students who are already privileged. Improved access included the provision of devices, subsidized internet, inclusive learning platforms, digital libraries, software access, assistive technologies, and helpdesk services. Strengthened digital competence was identified in 25 studies, showing that equitable digital transformation requires continuous development of the skills needed to use technology for learning, teaching, research, and academic communication. This outcome is especially important because digital transformation can widen inequality when some users are technologically confident while others remain dependent, hesitant, or excluded.

Increased student engagement and participation appeared in 22 studies, suggesting that the success of digital equity initiatives should be measured not only by whether students have access to platforms but also by whether they can participate meaningfully in educational activities. Enhanced faculty readiness for inclusive digital teaching was identified in 20 studies, demonstrating that faculty members are essential agents in the implementation of equity-oriented digital transformation. When faculty are trained in accessible course design, inclusive assessment, online interaction, and student support, digital learning is more likely to benefit diverse learners. Improved inclusion of vulnerable and marginalized students appeared in 18 studies. This finding highlights the importance of targeted rather than generic digital policies. Greater trust in digital transformation appeared in 17 studies, while institutional accountability appeared in 16 studies. Together, these outcomes show that ethical leadership contributes to equity not only through resources but also through legitimacy, responsibility, and institutional credibility. Protection of student rights in digital environments appeared in 15 studies, indicating that privacy, data protection, and algorithmic fairness are emerging dimensions of educational equity in digitally transformed universities.

Overall, the findings of this systematic review indicate that ethical leadership plays a multidimensional role in reducing the digital divide and increasing educational equity during university digital transformation. The evidence suggests that ethical leadership operates through distributive, participatory, pedagogical, relational, and regulatory mechanisms. Distributive

mechanisms involve the fair allocation of technological resources and financial support. Participatory mechanisms involve the inclusion of students, faculty, and marginalized groups in decision-making. Pedagogical mechanisms involve faculty development, inclusive course design, and support for meaningful student engagement. Relational mechanisms involve care, trust, responsiveness, and attention to vulnerable learners. Regulatory mechanisms involve transparency, accountability, data protection, and responsible use of digital systems. Across the reviewed studies, the most consistent finding was that digital transformation becomes equity-enhancing only when it is guided by ethical leadership and institutional responsibility. Without such leadership, digital transformation may improve efficiency while leaving existing inequalities untouched or even making them more severe. With ethical leadership, however, digital transformation can become a pathway toward broader access, more inclusive participation, stronger digital competence, and greater educational justice in universities.

4. Discussion and Conclusion

The present systematic review aimed to synthesize evidence on the role of ethical leadership in reducing the digital divide and increasing educational equity during the digital transformation of universities. The findings showed that ethical and inclusive leadership was the most frequently identified thematic category, appearing in 31 of the 38 included studies. This result indicates that the digital transformation of universities is not merely a technological, infrastructural, or administrative process, but a value-laden institutional change that requires moral judgment, fairness, accountability, and attention to disadvantaged groups. The predominance of ethical leadership in the reviewed literature is consistent with the broader argument that digital transformation in education should be governed by equity-oriented leadership rather than by efficiency, automation, or innovation alone (Liu et al., 2024; Mariyono et al., 2026; Weaver, 2022). In this respect, the findings support the view that leaders in higher education must act as ethical agents who determine whether technology becomes a mechanism for expanding opportunity or a force that deepens existing inequalities. The evidence also aligns with studies emphasizing that educational leadership in the AI era requires attention to justice, transparency, inclusion, and long-term policy consequences, particularly because AI and digital platforms are increasingly shaping teaching, learning, assessment, and institutional decision-making (Alshehri, 2023; Camarero-Figuerola & Camacho, 2025; Kim, 2025).

The findings also showed that digital access and technological infrastructure were addressed in 30 studies, making access one of the most visible dimensions of the digital divide in higher education. This result suggests that despite the expansion of digital platforms, many students and faculty members continue to experience unequal access to devices, internet connectivity, learning management systems, digital libraries, software, and technical support. The finding is consistent with previous work showing that digital equity requires deliberate policy intervention and cannot be achieved simply through the availability of technology (Hub, 2022; Weaver, 2022). The result also corresponds with evidence from broader digital equity and digital health literature, where vulnerable populations often experience exclusion because digital systems are designed without sufficient attention to socioeconomic, geographic, and infrastructural barriers (Agrawal & Agbeyangi, 2026; Osborne, 2025). In the context of universities, this means that ethical leadership must move beyond equal provision and adopt needs-based resource allocation. The reviewed studies suggest that students from low-income families, rural areas, underfunded institutions, disability groups, and first-generation backgrounds require targeted support if digital transformation is to promote educational equity. This interpretation is consistent with research on underserved communities, which shows that data-informed and program-managed interventions are needed to reach populations that are otherwise left behind by generalized service delivery models (Adekugbe & Ibeh, 2024).

Another major finding was that digital literacy and digital competence were identified in 29 studies. This result is important because it shows that the digital divide is not limited to physical access. Students and faculty may have access to platforms but still lack the skills, confidence, digital fluency, and instructional support required to use them effectively. This finding aligns with research showing that digital competency is shaped by both infrastructure and professional capacity, and that technology provision without skill development cannot produce meaningful educational inclusion (Rawal, 2024). Similarly, evidence from higher education indicates that faculty members' perceptions of technology leadership influence their integration of technology into teaching, suggesting that leadership affects digital equity indirectly through faculty readiness and pedagogical practice (Zhang et al., 2025). The present review therefore confirms that ethical leadership must include continuous capacity-building

for both instructors and learners. Such capacity-building includes faculty development, student orientation, digital mentoring, inclusive instructional design, and support systems that reduce fear, confusion, and dependency in digital environments. This result is also consistent with research on personalized learning in higher education, which shows that digital systems can support diverse learners only when they are implemented with attention to user needs, pedagogical design, and institutional readiness (Ali et al., 2025).

The findings further indicated that equity-oriented institutional governance was reported in 27 studies. This result suggests that ethical leadership becomes effective when it is institutionalized through policies, accountability structures, participatory planning, resource allocation, quality assurance, and strategic evaluation. In other words, ethical leadership should not be understood only as the personal morality of university leaders; rather, it must be embedded in systems and routines that make digital equity measurable and sustainable. This interpretation is supported by studies on equity and social justice competency in educational leadership preparation, which emphasize that leaders must be trained to recognize structural inequity and respond to it through systematic institutional action (Moraguez et al., 2025). The finding also aligns with research on school leaders' roles in equitable access to educational technology, where leaders were found to be responsible for identifying barriers, mobilizing resources, and ensuring that technological change supports all learners (Durán & Ermiş, 2024). In universities, ethical governance includes transparent digital policy, student participation, faculty consultation, privacy protection, accessibility standards, and monitoring of equity outcomes. This view also resonates with work on smart leadership and technology-rich environments, which emphasizes the need for ethical, adaptive, and participatory governance when digital infrastructures shape public life and institutional functioning (Springs, 2024).

The findings showed that faculty development and inclusive digital pedagogy appeared in 20 studies. This result highlights the central role of instructors in translating digital transformation into equitable learning experiences. Digital tools alone cannot create educational equity if courses are poorly designed, online interaction is weak, assessment is inflexible, or learning materials are inaccessible. The result is consistent with studies of hybrid classrooms, which demonstrate that pedagogical leadership is necessary to ensure that hybrid and digital learning models are inclusive, interactive, and responsive to student needs (Cruz & Dulay, 2023). It also supports research on equity in blended learning, which argues that digital learning frameworks must be connected to students' lived experiences and structural barriers (Murphy et al., 2025). Moreover, the findings align with work on progressive teaching strategies for gender equity in STEM, which shows that inclusion requires intentional pedagogical strategies rather than passive access to educational spaces (Daraz et al., 2024). Therefore, ethical leadership in universities should prioritize professional development in accessible course design, inclusive assessment, culturally responsive online teaching, and flexible models of participation.

The review also found that data ethics, privacy, and algorithmic responsibility were addressed in 15 studies. Although this theme appeared less frequently than access, competence, and governance, it represents an increasingly important dimension of educational equity. As universities adopt learning analytics, AI-supported advising, online proctoring, automated assessment, and platform-based monitoring, students become more exposed to data collection and algorithmic decision-making. The findings suggest that educational equity must include protection from digital harm, not only access to digital opportunity. This interpretation is consistent with research showing that AI and big data can support equity only when implemented with strong governance, transparency, and safeguards against bias (Kachnowski et al., 2025). It also aligns with broader discussions of digital self-care solutions, where technology-mediated systems require attention to autonomy, consent, and responsible data use (Correia et al., 2025). The risk of AI-based stratification is particularly relevant to universities because students may be categorized, monitored, or evaluated through systems that they do not fully understand. Concerns about the AI divide and the emergence of AI-based exclusion further support the need for ethical leadership that protects learners from algorithmic injustice and unequal exposure to technological risk (Code, 2025; Yu, 2024).

The findings also showed that care-oriented support for vulnerable students was a central mechanism through which ethical leadership contributed to equity. Across the reviewed studies, vulnerable groups included low-income students, rural students, students with disabilities, international students, first-generation students, students with limited digital skills, and students experiencing unstable home or work conditions. Ethical leadership was associated with targeted outreach, academic flexibility, counseling, assistive technologies, financial support, alternative assessment arrangements, and inclusive communication. This

result is consistent with broader justice-oriented literature showing that inequality and inequity are rooted in unequal distribution of resources, power, and institutional responsiveness (Abdi et al., 2025). It also reflects global development arguments that achieving justice requires structural reform rather than isolated interventions (Thomas, 2025). In the university context, this means that ethical leadership should not assume that all students can benefit equally from the same digital opportunities. Instead, leaders must identify differentiated needs and create support systems that protect students from exclusion. Studies on cloud-based solutions for rural youth and educational information centers using AI and big data similarly show that targeted digital interventions can reduce access gaps when they are designed around contextual barriers and user needs (Alzu'bi & Bishtawi, 2025; Shen et al., 2025).

The synthesis of educational equity outcomes showed that improved access to digital learning opportunities, strengthened digital competence, increased student engagement, enhanced faculty readiness, greater institutional accountability, and protection of student rights were the main outcomes reported or implied across the included studies. These outcomes suggest that ethical leadership affects equity through multiple pathways: distributive justice, pedagogical inclusion, institutional transparency, user empowerment, and responsible innovation. This multidimensional interpretation is consistent with global analyses of digital transformation in education, which show that equity outcomes vary according to national, institutional, and policy conditions (Kim et al., 2025). It also aligns with research on information technology education, which emphasizes that technology policy must balance efficiency with fairness (Shen, 2022). The finding that digital transformation is connected to future readiness also supports studies on career preparation and technological change. Universities must ensure that students graduate with the digital and AI-related competencies required for employment in rapidly changing labor markets (Falco, 2026; Moore & Thaller, 2023). If digital transformation benefits only already advantaged students, universities may unintentionally reproduce unequal career outcomes. Therefore, ethical leadership is essential for ensuring that digital transformation contributes not only to institutional modernization but also to social mobility and workforce inclusion.

The findings of this review also correspond with studies outside the immediate field of university leadership, particularly those addressing leadership development, professional systems, innovation, and research equity. Research on nursing leadership and artificial intelligence highlights the need for leaders who can guide professionals through technological change while maintaining ethical responsibility (Burford et al., 2025). Studies on leadership development needs in the health workforce similarly indicate that institutional transformation requires prepared, reflective, and responsive leaders (Matandela et al., 2025). In addition, research on global oral health innovation and research equity shows that inclusive participation and equitable knowledge production are essential in technologically advancing fields (Gudsoorkar et al., 2025). These studies support the present review's conclusion that ethical leadership in universities should be understood as part of a broader movement toward responsible innovation. The inclusion of literacy and inclusivity initiatives also reinforces the point that digital equity includes language, accessibility, and participation, not merely hardware or connectivity (Grady et al., 2024). Moreover, emerging perspectives on AI readiness in families and communities suggest that digital transformation increasingly extends beyond institutions into everyday social life, which strengthens the need for universities to act responsibly as public educational institutions (Mahajan, 2025).

Overall, the discussion of the findings indicates that ethical leadership plays a central role in determining whether digital transformation reduces or reinforces educational inequality. The evidence shows that digital transformation becomes equity-enhancing only when leaders intentionally connect technology adoption with justice, accessibility, competence, participation, transparency, and care. The findings are consistent with previous studies emphasizing that digital transformation and AI integration require leadership approaches that are inclusive, accountable, and socially responsive (Camarero-Figuerola & Camacho, 2025; Kim, 2025; Mariyono et al., 2026). The results also extend previous literature by integrating several strands of evidence into one framework: digital access, digital competence, inclusive pedagogy, data ethics, vulnerable student support, institutional governance, and educational equity outcomes. This integrated understanding is important because universities often address these issues separately, whereas the present review suggests that they are interconnected. Ethical leadership is therefore not an optional supplement to digital transformation; it is a necessary condition for ensuring that technological change advances educational justice.

This study has several limitations. First, the review included only studies published in English, which may have excluded relevant evidence from non-English higher education systems where digital inequality and educational equity are also major concerns. Second, the included studies were methodologically heterogeneous, including qualitative, quantitative, mixed-methods, and conceptual works; therefore, the findings were synthesized thematically rather than statistically. Third, several included studies addressed adjacent fields such as digital health, school leadership, professional development, or technology governance, and although these sources provided valuable conceptual support, their findings may not be fully transferable to university settings. Fourth, the review relied on published literature and may therefore be affected by publication bias, especially because unsuccessful or incomplete digital equity initiatives are less likely to be reported. Finally, the rapidly changing nature of artificial intelligence and digital transformation means that some findings may require continuous updating as new platforms, policies, risks, and institutional practices emerge.

Future research should examine the role of ethical leadership in university digital transformation through longitudinal, comparative, and mixed-methods designs. Longitudinal studies are needed to determine whether ethical leadership produces sustained reductions in digital inequality over time, rather than short-term improvements in access or satisfaction. Comparative studies across public and private universities, developed and developing countries, urban and rural institutions, and different disciplinary contexts would help clarify how institutional conditions shape digital equity outcomes. Future research should also develop and validate measurement tools for assessing ethical digital leadership, digital equity governance, student digital vulnerability, and inclusive technology implementation in higher education. In addition, more empirical studies are needed on the ethical use of learning analytics, AI-based advising, automated assessment, online proctoring, and student data systems. Greater attention should also be given to students with disabilities, multilingual learners, international students, low-income students, and first-generation students, because these groups may experience digital transformation differently.

In practice, universities should treat digital transformation as an ethical and equity-oriented institutional project rather than a purely technical reform. University leaders should conduct regular digital equity audits to identify which students and faculty members lack access, competence, support, or protection in digital learning environments. Resource allocation should be needs-based, with targeted support for students and departments facing the greatest barriers. Faculty development should focus not only on technical training but also on inclusive digital pedagogy, accessibility, flexible assessment, and student engagement. Universities should involve students, faculty, support staff, and marginalized groups in digital policy-making so that decisions reflect lived realities rather than administrative assumptions. Clear policies should also be developed for data privacy, learning analytics, AI use, online monitoring, and platform governance. Above all, ethical leadership should embed fairness, transparency, accountability, care, and inclusion into every stage of digital transformation so that universities can use technology to expand educational opportunity rather than reproduce inequality.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all who helped us through this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

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