School and Institutional Policies as Catalysts for Teacher Adaptation to Digital Learning in the New Era

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ABSTRACT

Technology-based learning transformation requires teachers, especially those in the early years of their careers, to face changes in their roles that are not only technical, but also psychosocial and institutional. This study examines in depth the dynamics of novice teachers' adaptation, coping strategies, and the influence of institutional practices and school policies in supporting the successful integration of technology in the classroom. The analysis reveals that psychological pressure and adaptation barriers often stem from individual capacity gaps and a lack of practical experience. However, the existence of a supportive pedagogical community, reflective routines, and access to digital training play a substantive role in encouraging resilience and innovation. Institutional factors, such as strengthening the digital vision, providing infrastructure, and reward systems, play an important role in creating an educational ecosystem conducive to teacher transformation. The implementation of participatory policies and data-based quality assurance strengthens the validity and accountability of educational institutions. This article emphasizes the need for simultaneous reform at the individual, institutional, and educational system levels so that digital learning can be implemented effectively, sustainably, and provide room for growth for novice teachers. Recommendations include strengthening collaboration, developing contextual training, and continuously monitoring the success of learning digitalization.

INTRODUCTION

The changes in the global educational landscape triggered by the digital revolution have demanded a paradigm shift in the duties and functions of teachers. In the past, teachers held a dominant position as the sole source of knowledge in the classroom, directing learning in a linear fashion and exercising complete control over the material, methods and evaluation. However, advances in digital technology have democratized access to information, compelling teachers to make significant changes to their pedagogical practices. This process has created new demands for teachers to transition from their traditional role as instructors to that of adaptive and reflective technology-based learning facilitators (Tondeur et al., 2016). These transformative demands are in line with global logic, where technology is at the core of strategies to achieve sustainability and competitiveness. As analyzed by Mardikaningsih and Hariani (2023), the adoption of technological strategies is a necessity for continuous innovation in the global market. Thus, the transition of the teacher's role to that of a digital facilitator cannot be viewed merely as a pedagogical requirement, but also as a necessary strategic response to ensure that the education system remains relevant, adaptive, and contributes to the sustainable development of human resources on the global stage.

This transformation of the teacher's role has consequences at the personal, social, and educational policy levels. Teachers who pursue a career in the digital era, especially at the beginning of their service, are faced with multiple expectations that may not necessarily be in line with their initial professional competencies. Increased administrative pressures such as online reporting, digital learning management systems, and curriculum adjustments cause anxiety and additional mental stress (Kelchtermans, 2017).

In addition, increasingly complex working relationships require teachers to manage classrooms that are increasingly dynamic and diverse in terms of technology and student backgrounds. The dynamics

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of pressure and transformation experienced by teachers cannot be separated from broader cultural and social practice changes in the digital era, as examined by Al Hakim et al. (2021). This means that the challenges faced by teachers are not only pedagogical or administrative issues, but also a direct manifestation of the transformation of values and social practices in the world of education, which is adapting to a new digital landscape. Therefore, adaptation to this digital landscape must critically consider the principle of inclusivity. As analyzed by Ramle and Mardikaningsih (2022) regarding technology-based services, the success of transformation greatly depends on how access challenges and skill gaps are addressed.

Adapting to this ever-changing work environment requires not only technical skills, but also psychological endurance and personal resilience. Recent studies show that many novice teachers experience emotional pressure, stress, and even chronic fatigue due to the gap between the theory they learn at teacher training colleges and the real situations they encounter in the workplace (Hong, 2012). Variations in coping strategies, ranging from seeking social support and adjusting expectations of oneself to creative coping behaviors, are individual responses to the uncertainty experienced.

To capture the authentic experiences and meanings of this role shift, a hermeneutic phenomenological approach is relevant in examining teachers' perceptions and interpretations of their daily practices. Qualitative literature studies with thematic synthesis have developed extensively as a methodological design that allows for the combination of multivocal academic sources to comprehensively examine the dynamics of teacher role transitions (Booth et al., 2021). With this technique, mapping of dominant themes and issues can be carried out in a structured manner based on empirical research evidence from the last two decades.

Various literature mentions that adaptation to the role of digital learning facilitators is often hampered by the gap between the theory taught in pre-service education and the complexity of practice in schools (Korthagen, 2017). New teachers are often caught up in time-consuming administrative routines and managerial obligations, so that the space for self-actualization as technology facilitators is marginalized. This pressure is exacerbated by high expectations from schools and parents regarding student achievement, inclusive classroom management, and the ability to accommodate student diversity. These structural and social barriers exacerbate what is more broadly referred to as the digital divide, where not all parties have equal capacity to participate and make optimal use of technology. As analyzed by Issalillah and Hardyansah (2022), the digital divide and misinformation can reduce participation and trust in local communities. Failure to support new teachers in adapting to the role of digital facilitators can be detrimental to individual teachers and can deepen the gap in participation and quality of education at the school community level.

The feelings of alienation, anxiety, and even exhaustion experienced by teachers cannot be separated from the lack of adequate social and institutional support. Many studies have found that workload and social isolation are the main drivers of burnout and even dropout in the early years of a teacher's career (Gallant & Riley, 2014). The need for mentors, professional networks, and supportive incentive systems is rarely met, while institutional policies are not yet fully responsive to the psychosocial realities of teachers.

Mendonca et al. (2021) in their research discuss the development of technical and social competencies needed for future-ready education in a digitally mediated work environment. However, developing competencies without serious attention to psychological aspects and mental resilience risks counterproductive consequences, such as high attrition rates among qualified teachers. On the other hand, the high risk of attrition or loss of qualified teachers necessitates serious studies that not only highlight pedagogical and digital competency readiness but also examine teachers' mental readiness and survival strategies. Studies on the effects of stress, anxiety, and survival strategies are rarely found in Indonesian literature, making efforts to promote mental preparedness, attitude adjustment, and institutional change an important agenda in building a healthy digital education ecosystem.

The massive wave of education digitalization in recent years has placed teachers and educational institutions at an important crossroads in the history of role transformation. The increasingly heterogeneous background of students demands adaptive technology-based learning policies, while also pressuring teachers to develop personal resilience and digital literacy skills. Ignoring this phenomenon risks widening the quality gap in education and exacerbating the problems of burnout and attrition among young teachers. The pressure to adapt to fundamental changes in working relationships, organizational dynamics, and digital literacy demands, as explored in a study on transformation in the digital age by Darmawan et al. (2023), is a cross-

sector reality that is also intensely felt in the education ecosystem, underscoring the urgency of responsive managerial and policy approaches.

The growth in public expectations for the quality of digital-based education is not matched by the readiness of competent educational institutions. Teachers are often encouraged to face technological and bureaucratic changes without clear guidance, mentors, or support systems, resulting in physical, mental, and psychological exhaustion. Therefore, exploring the role of teachers as digital facilitators is highly relevant as a basis for strengthening professional development policies and reforming school support systems.

This paper aims to reconstruct the psychosocial dynamics of teachers, their coping strategies, and determine the influence of institutional policies in transforming the role of teachers as learning facilitators in the digital era based on a synthesis of the latest literature. This article is expected to enrich the field of education management by presenting systematic findings related to teachers' adaptation and innovation coping strategies, along with a map of school institutional conditions and recommendations for evidence-based digital learning.

RESEARCH METHOD

This study employs a qualitative literature review design with thematic synthesis to examine and reconstruct the shift in the role of teachers from traditional educators to learning facilitators in the digital age. The inclusion criteria for articles are that they are academic books or peer-reviewed journal articles in English or Indonesian, published in the last two decades, and explicitly discuss teachers' psychosocial adaptation, coping strategies, and technology-based role transformation. Meanwhile, sources that did not meet the peer-review criteria or focused on the context of out-of-school education were excluded from the analysis. The literature selection process was carried out by evaluating the title, abstract, and full text to ensure the relevance and authority of the scientific sources. A systematic approach to searching and analysis minimized selection bias and increased the credibility of the synthesis (Snyder, 2019).

The reference search strategy was conducted through leading online databases such as Scopus, Web of Science, and Google Scholar. The authors used advanced search features and Boolean operators to efficiently expand or narrow the results (Booth et al., 2021). Data were extracted based on the research objectives, respondent characteristics, scope of the study, type of intervention or policy, and relevant psychosocial and institutional dimensions. Literature quality assurance was carried out by examining the methodological quality and content suitability of each study (Creswell & Poth, 2017).

The coding and thematic synthesis stages followed the Braun and Clarke model, which included: familiarization with the data, development of initial codes, search for themes, review of themes, naming, and writing of the final synthesis. Each extraction result and data code was compared repeatedly until consistent main themes and sub-themes were found. Data validity was maintained through peer debriefing and triangulation between authors when there were differences in interpretation. Thus, this study produced a comprehensive and academically accountable mapping of themes (Braun & Clarke, 2006).

RESULT AND DISCUSSION

Teachers' Psychosocial Adaptation and Resilience in the Transition to Digital Roles

Rapid changes in the digital education ecosystem demand far more complex emotional and professional readiness from novice teachers. The application of smart digital technology in education systems has grown rapidly in recent years, opening up new opportunities, dilemmas, and challenges in modern society (Mhlongo et al., 2023). The transformation of the teacher's role in the digital age not only tests professional capacity but also demands high psychosocial resilience, especially in the early years of one's career. Many novice teachers experience significant anxiety and emotional pressure when transitioning from traditional teaching models to technology-based learning facilitators. The main factor causing this pressure is the gap between the theoretical knowledge gained during formal education and the reality of the demands of using digital technology in the classroom (Tondeur et al., 2017). This situation is exacerbated by the requirement that digital platforms and teaching materials for teaching and learning activities must comply with current educational guidelines and procedures, which in practice adds to the burden of adaptation for teachers (Alenezi, 2023). The unpreparedness of technological infrastructure, the increased administrative burden due to online reporting and learning management through digital platforms, and the demand for personalized learning for a diverse range of students exacerbate teachers' stress (Kelchtermans, 2017).

Novice teachers also face high expectations from schools and parents who want them to quickly adapt to managing digital classrooms, even though they often have limited practical experience. In this situation, many experience feelings of isolation, exhaustion, and even self-doubt (Hong, 2012).

International studies show that common coping strategies include seeking social support from peers or professional communities, developing mental adaptation through critical reflection, and establishing adaptive work routines. Some teachers choose to develop their digital knowledge through self-directed training or sharing good practices with colleagues (Gallant & Riley, 2014). However, the effectiveness of these coping strategies varies greatly depending on institutional support, individual resilience, and school culture (Korthagen, 2017). Those who are able to balance administrative demands, classroom management, and self-development are generally more resistant to burnout and tend to stay longer in the profession, while those with less support are more prone to fatigue and dropout in the early stages of their careers. The ability of novice teachers to navigate digital demands is greatly influenced by the support of the professional environment and the space for adaptation available in daily practice.

Understanding how teachers build professional resilience is important for seeing how they respond to pressure in digital teaching practices. Teachers who successfully adapt usually apply a combination of intrapersonal and interpersonal strategies in dealing with pressure. Intrapersonal, self-reflection, setting realistic goals, and good time management are the main foundations for maintaining mental health. Support from family and the educational community contributes to the growth of self-confidence and social attachment, which are important for professional development amid technological advances and bureaucratic changes. Collaboration between teachers and access to formal and informal mentoring also help reduce feelings of isolation and foster a commitment to developing professionalism in line with technological developments (Korthagen, 2017). Bitter experiences, such as failure in using digital platforms or facing student resistance to new methods, can actually become learning capital if teachers receive constructive feedback and the opportunity to process their experiences openly. Ultimately, resilience, the ability to learn from every failure, and the drive to seek innovative solutions will strengthen the position of teachers as facilitators of learning that is relevant to the digital age. Strategies developed from these experiences help strengthen teachers' professional readiness for the next stage.

Differences in the quality of institutional support are often a determining factor in teachers' mental readiness to face the demands of digital teaching. The literature highlights the large disparity in mental readiness between teachers who receive systematic support (e.g., induction programmers, structured technology training, ongoing supervision) and those who do not. Teachers with supportive work environments report lower stress levels, higher self-confidence, and a greater tendency to remain in the profession (Gallant & Riley, 2014; Kelchtermans, 2017). On the other hand, teachers in competitive, bureaucratic, and uncollaborative environments experience burnout more quickly and eventually leave the profession. A study by Tondeur et al. (2016) found that digital adaptive skills and self-acceptance of change must be cultivated from pre-service education as a basic capital to reduce resistance and dependence on old teaching patterns. In addition, the importance of gradual digital literacy and reflective discussion spaces are key to building collective psychosocial resilience. These findings indicate that strengthening adaptive capacity needs to be continuously developed as the demands of the profession become more complex.

The tension between pedagogical aspirations and technological limitations is often an initial challenge for new teachers. New teachers also often experience internal conflicts between the desire to provide learning innovations and the limitations of available technological resources. This dilemma causes frustration, especially if there is no consistency in school policy in supporting digital experimentation or consultation spaces for sharing experiences. Those who are able to think flexibly and are open to change are more likely to respond to this situation creatively, such as by utilizing simple platforms or gradually combining conventional methods with digital tools (Hong, 2012). Some choose to adopt emotional coping strategies, such as lowering expectations or using humor to maintain psychological balance, while continuing to seek solutions to the obstacles they face in the digital classroom. The creative and emotional responses they choose provide direction for the adaptation process in the next stage.

The development of teachers' resilience is often influenced by how they interpret their daily experiences in the digital classroom. These resilience skills do not develop instantly, but rather through the accumulation of daily experiences in facing various obstacles and pressures. The process of reflective deliberation, both individually and collectively, accelerates adaptation to the rapidly changing digital environment. Teachers who are accustomed to reviewing their practices and are willing to experiment with new approaches tend to have a higher level of adaptation. The willingness to continue

learning and updating knowledge is a characteristic of teachers who are psychosocially capable of surviving in complex and multidimensional professional dynamics. This pattern of continuous learning provides direction for strengthening professional resilience in subsequent phases.

Oluwatoyin (2021) analyzed the dynamics of social interaction in the digital age and the implications of technology on interpersonal relationships and psychosocial well-being, highlighting fundamental changes in how humans relate to one another. This analysis found direct relevance in the context of the teaching profession, where digital technology has transformed the ecosystem of interaction and the social pressures within it. The structural and social pressures that accompany digital teaching practices also shape the early experiences of new teachers. The quality of education and the readiness of students to face an ever-changing global context are directly influenced by the empowerment of teaching staff in the digital age (Aithal & Aithal, 2023).

Meanwhile, parental expectations regarding technology-based student achievement, coupled with internal pressure to provide equal learning services to all students, often add to the stress experienced by new teachers (Kelchtermans, 2017). Interactions on social media and in the digital world shape individuals' self-identity and social perceptions. For new teachers, the demand to appear competent, adaptive, and digitally connected can be an additional burden in their journey to build an authentic professional identity (Costa et al., 2022). In some cases, teachers in schools with a high level of student diversity are forced to adjust their work rhythms and communication patterns very quickly in order to remain relevant in the eyes of students and the wider educational community. In this regard, the literature recommends the importance of institutional policies that are oriented towards the psychological and social well-being of teachers, rather than merely administrative targets. Policies that provide space for teacher well-being are the starting point for strengthening further professional practices.

Social relations in the workplace often determine how successfully teachers adapt to digital demands. Beyond institutional pressures, interpersonal relationships between teachers and colleagues are an important asset for the adaptation process and the formation of professional networks. Several studies confirm that informal interactions between teachers in learning communities can foster solidarity and the exchange of ideas and effective coping strategies for dealing with the challenges of digitalization (Gallant & Riley, 2014). Regular dialogue and discussion about classroom situations, successes and failures in implementing technology, including simple everyday stories, are often more meaningful than formal, one-way training. This kind of exchange of experiences provides initial impetus for strengthening professional practice at a later stage. This collaborative and dialogical process is also a concrete manifestation of efforts to build an ethical and responsible technology ecosystem at the micro (school) level. As emphasized by Radjawane and Mardikaningsih (2022), the development and application of responsible technology require a collaborative approach and ethical considerations. Thus, the teacher learning community not only functions as a social support system, but also as an incubation space for fostering critical awareness and digital pedagogical practices that are fair, relevant, and centered on human values.

The aspect of institutional recognition is often an early determinant of the career development of new teachers. The career development of teachers in their early years is also greatly influenced by the reward and appreciation system received from school leaders, both in the form of recognition of achievements and non-material incentives. This kind of recognition has been proven to be effective in increasing intrinsic motivation and reducing the risk of burnout that often haunts new teachers (Korthagen, 2017). The balance between work demands, personal capacity development, and appreciation for adaptation efforts is a combination that ensures the continuity of a teacher's career as a learning facilitator in the technological era. This form of appreciation provides initial encouragement for strengthening motivation and continuing professional practice.

Various personal and structural factors contribute to how teachers navigate psychosocial demands in the digital age. The psychosocial dimensions and coping strategies of teachers are essentially inseparable from the complex interactions between individuals, the work environment, and education policy. The development of resilience, effective adaptation patterns, and the creation of a supportive ecosystem are crucial to the success of teachers in carrying out their new roles. Ultimately, teachers who are able to develop reflection, digital literacy, and strong social networks are better prepared to face the dynamic demands of the profession in the era of digital learning, while also setting an example for future generations of educators. These abilities provide a starting point for strengthening their professional role in the next stage of development. The dynamics of adaptation and

self-management strategies such as these are a relevant phenomenon in various areas of life in the digital age. As examined by Safira et al. (2021) regarding the transformation of social practices amid the influence of technology, the adaptation process requires choices, awareness of impacts, and a reorganization of roles. Thus, strengthening teachers' capacities can be seen as an integral part of broader collective efforts to build digital literacy and resilience across all levels of society.

The integration of personal aspects and environmental support often determines teachers' resilience in facing the dynamics of technology-based work. The integration of intrapersonal factors such as self-awareness and emotional regulation with social support and a supportive environment result in teachers who are flexible in facing change, psychologically resilient, and able to navigate the complexities of bureaucracy and technology. The central role of school policies that emphasize administrative balance, innovation, and psychosocial support provides a strong foundation for the adaptation process of novice teachers. They ultimately avoid burnout symptoms and are more motivated to contribute to the development of sustainable and meaningful digital learning. These conditions provide initial impetus for strengthening the professional role in the next phase of development.

Institutional and Policy Support for the Transformation of Technology Learning Teachers

Digital transformation at the institutional level is often determined by the extent to which the vision of technology is internalized in daily practices. The rapid development and application of information technology in education have opened up opportunities for educators, learners, and administrators to create and use effective tools and methods in the teaching and learning process (Nguyen & Tuamsuk, 2022). Institutional practices oriented towards digital transformation begin with the development of a school vision and mission that explicitly integrates technological values (Yehya, 2021). This innovative vision is not merely a formal statement, but is applied in the design of work programmers, evaluations, and institutional performance indicators. Schools that build consensus through open and democratic internal deliberations are able to create a sense of ownership of the transformation agenda, so that every teacher feels that their role is valued. The implementation of a digital vision requires management commitment, not just a change of tools, but a restructuring of institutional routines and supervision methods. Institutions face greater challenges in their capacity and ability to adapt by improving teaching quality while streamlining bureaucracy in processes and freeing up the resources needed for innovative approaches to education, curriculum design, and research networks (Kralj, 2022). The involvement of all elements, from school principals to administrative staff, is a solid foundation for changing the behavior and mentality of the entire educational community.

Successful institutions usually also build networks of cooperation with external institutions such as universities, technology companies, and professional communities, so that new resources and knowledge flow continuously. Practices such as internal seminars, regular teacher discussions, and innovation evaluation forums strengthen a collective system based on data and reflection, rather than assumptions or old traditions. Thus, the foundation of teachers' ability to adapt as digital facilitators is not formed instantly, but through a collective ecosystem that is adaptive, collaborative, and always open to change. This kind of collective process provides an initial direction for strengthening the adaptive capacity of the education community in the next stage.

The planned management of technological resources is an important element in ensuring the success of school digitalization. The preparation of technological resources in educational institutions involves more than just the procurement of hardware such as computers, projectors, or internet networks (Elkordy & Iovinelli, 2021). The seriousness of schools in designing asset management systems, routine maintenance schedules, and the formation of technical service units is crucial to the sustainability of tool use in the field. Competent human resources in the field of technology, such as education technicians or ICT coordinators, are also a strategic investment to support teachers in overcoming daily technical obstacles. The allocation of specific time in the lesson schedule for digital exploration, learning media development, or software utilization training is one indicator of a school's commitment to digitalization. The existence of a flexible special budget allows innovation to proceed without waiting for convoluted hierarchical decisions.

In addition, fair, integrated, and non-discriminatory resource access policies, such as giving priority to teachers who are developing innovation projects, can motivate the active participation of all educators. Resource preparation also includes the availability of supporting facilities, such as digital collaboration rooms, learning studios, or virtual libraries, which can be used as a means of exploration and sharing of good practices among

teaching staff. These efforts provide a starting point for strengthening a more innovative learning ecosystem in the next stage.

Responsively designed institutional policies are often the main drivers of change in the role of teachers in the digital age. School policies play a strategic role in guiding the concrete steps of the transformation of the role of teachers (Cattaneo et al., 2021). Schools that implement field-based policies are more responsive to rapid changes in the educational technology ecosystem. For example, blended-learning policies and the formation of digital innovation teams tend to accelerate the transfer of good practices across all lines of education. Formal rules regarding teacher participation in digital training, monitoring the use of learning technology, and participatory feedback from students and parents are effective evaluation mechanisms. Incentive policies, rewards for teaching experiments, and scholarships for further study in ICT also strengthen educators' intrinsic motivation to continue innovating. On the other hand, teacher performance assessment tools that are adapted to the demands of the digital age will increase the relevance of teachers' professionalism to future needs. Progressive schools will also provide space to periodically revise policies through open discussion forums, so that the aspirations and obstacles experienced by educators can be managed flexibly and adaptively. This kind of policy approach provides an initial direction for strengthening the innovative capacity of educators in the next stage.

Inter-unit cooperation within schools is often an important foundation for the successful integration of technology into learning. Cross-unit collaboration within institutions is one of the main drivers of successful technology-based learning. Collaborative practices include team-based development of digital teaching modules, implementation of ICT-based interdisciplinary projects, and collective evaluation of the implementation of virtual classroom innovations. Learning community forums, online discussion groups, and inter-teacher mentoring not only enrich digital learning strategies but also develop collective leadership that ensures the continuity of innovation. Schools that support cross-disciplinary collaboration are not afraid to take risks in testing new methods, allowing an environment of experimentation and creativity to flourish without fear of failure. Collaboration with external partners, such as research institutions, technology startups, or professional training institutions, broadens teachers' insights while providing access to the latest references and technologies. All these practices create a dynamic ecosystem that encourages the continuous growth of teachers' competencies, in line with institutional interests and the demands of educational globalization. This series of collaborative practices provides an initial direction for strengthening the innovative capacity of the education community in the next stage. Thus, the issues of access and digital skills are foundations that must be complemented by the development of a collaborative culture at the school level so that technology integration can reach its full transformative potential (Arifin & Darmawan, 2021).

A quality assurance system that is responsive to technological developments is often the main pillar of successful teacher role transformation. Quality assurance and institutional evaluation systems that are responsive to technological developments determine the success of teacher role transformation. The application of a monitoring system based on key performance indicators relevant to ICT, such as the level of teacher participation in digital training, the percentage of technology integration in the classroom, and student feedback on digital learning media, strengthens the validity of internal assessments. Periodic data-based evaluations help schools identify development gaps that need to be addressed immediately through policy interventions or targeted training. The use of information technology to automate and analyses this type of evaluation data, as explained by Arifin and Putra (2022) in the context of improving organizational managerial efficiency, is a key step in making the quality assurance process more accurate, faster, and impactful. In this improvement process, the principle of creating constructive solutions and restoring ideal conditions, as espoused in the concept of restorative justice in the context of digital law (Rianto et al., 2023), can be applied analogously. This means that the quality assurance system should not only seek out mistakes but should also function to restore and improve teachers' capacity collaboratively.

Another equally important aspect is the establishment of complaint channels and reflection forums for educators, so that their aspirations and problems can be directly addressed by management. Transparency in reporting achievements also strengthens the accountability of educational institutions in the eyes of the public and wider stakeholders. In the digital age, where public opinion is easily formed and the credibility of information is a challenge, as explained by Zulkarnain and Al Hakim (2023) regarding the evolution of digital media, transparency in quality assurance serves a dual purpose: as an internal accountability tool and

as a public communication strategy to build and maintain public trust in educational institutions. This evaluative approach provides a starting point for strengthening learning governance in the next stage.

Efforts to build a culture of digital innovation in schools often depend on how creative and collaborative values are brought to life in everyday practice. The development of a culture of learning and technological innovation in schools is closely related to strategies for internalizing creative, open, and collaborative values. Schools that regularly hold hackathons, innovative learning media competitions, and showcases or exhibitions of digital works by teachers and students have been proven to foster a spirit of healthy competition and boost the intellectual interest of the entire educational community. Access to open educational resources and training in digital learning content creation also broadens teachers' teaching horizons. The practice of resource-sharing between schools in a cluster, such as the exchange of digital teaching materials or sharing sessions on interactive media development, enriches experiences and strengthens networks between institutions. Thus, the culture of digital innovation is not just a slogan, but a reality of everyday life in the school community. These steps provide a starting point for strengthening a more progressive learning ecosystem in the next phase.

The quality of school leadership is often a determining factor in the success of technology-based learning transformation. The role of the headteacher as a visionary leader and change agent is key to ensuring the sustainability of technology-based learning transformation. A proactive, digitally literate headteacher who is able to be a role model will encourage teachers to continue learning and experimenting. Distributional leadership that provides space for teachers to participate in strategic decision-making creates a sense of confidence and professional autonomy, two factors that are very important for teachers to be ready to face the challenges of ICT implementation in the classroom. Effective leaders also actively establish two-way communication with all stakeholders, both internal and external, so that every policy change is socialized clearly and pragmatically at the operational level. This leadership approach provides an initial direction for strengthening teachers' innovative capacity in the next stage.

Incentive schemes and career development opportunities are often determining factors in teachers' success in adapting to digital demands. Financial and non-financial incentives and career development are important drivers of successful digital transformation. Advanced schools usually have special incentive schemes for teachers who successfully implement technology-based learning, for example in the form of allowances, promotions, further study opportunities, or publication of innovation results. The incentives provided do not have to be material, but can be in the form of symbolic awards, recognition through school media, or the privilege of representing the school in professional forums. These incentives increase teachers' intrinsic motivation to hone their digital skills and strengthen the retention of creative educators. On the other hand, an innovation-based career development path will encourage teachers to continue to adapt and seek creative solutions to various implementation obstacles. This reward-based approach provides an initial boost to strengthening professional motivation in the next phase.

The effectiveness of technology integration in the classroom is often determined by the quality of socialization and technical assistance provided by the school. The success of technology integration in learning also depends heavily on structured socialization, training, and technical assistance. Schools can arrange regular training schedules, either independently or in collaboration with educational technology training institutions, to ensure that all teachers are able to keep up with the latest developments. Periodic mentoring, either by more experienced fellow teachers or by technical staff, helps accelerate the adaptation process for novice teachers and reduces resistance to innovation. Practical, responsive, and problem-based training models tend to be more acceptable than one-way theoretical training models. The positive impact is that teachers are able to apply technology in teaching more effectively and confidently, because they are supported by a learning system based on real experiences.

The principle of building a foundation of trust and secure governance is particularly relevant when translated into the context of the digital education ecosystem at the school level. Harmonization between institutional practices, resource management, and policy direction is an important foundation for creating an education ecosystem that is resilient to change. Ultimately, innovative institutional practices, resource management, and integrated school policies form an education ecosystem that is resilient and proactive in the face of change. These three elements must work in harmony to avoid disruption or resistance during the implementation process. Schools that consistently evaluate and update policies, distribute resources fairly, and provide administrative and emotional support to teaching staff have a great opportunity to produce educational pioneers in the digital realm. Synergy

between all school components creates a sense of security, confidence, and belonging, enabling teachers to navigate their professional transformation optimally.

The success of the transformation of the role of teachers in technology-based learning is ultimately not merely a product of policy, but the result of adaptive institutional practices, smart resource management, and the courage to take innovative steps together. This synergy provides a starting point for strengthening the transformational capacity of the education community in the next stage. In this context, the aspects of data security and privacy for students and teachers, as highlighted by Gardi and Eddine (2023), must be an integral part of intelligent resource management and integrated school policies, as these are prerequisites for creating a sense of security and trust that supports digital transformation in schools.

CONCLUSION

The transformation of teachers in technology-based learning in the early years of their careers is a multidimensional process influenced by personal psychosocial factors, institutional practices, and sustainable school policies. The adaptation of novice teachers is often marked by feelings of pressure and doubt, but resilience can grow through community support, critical reflection, and safe spaces for experimentation. Externally, schools play a vital role through the formulation of needs-based policies, equitable allocation of digital resources, strengthening of a collaborative culture, and access to continuous training. The success of this change is the result of a responsive educational ecosystem, where the harmonization of individual and institutional capacities produces relevant and sustainable digital learning.

The results of this study reinforce the urgency of developing a holistic digital education ecosystem so that the transformation of the teacher's role does not stop at mere technical adjustments but develops into institutional cultural change. Schools need to adopt a participatory approach in designing policies, ensuring fairness in the distribution of technology access, and initiating regular interaction forums to share experiences and problems. Investment in human resources through meaningful training, mentoring facilitation, and innovation awards will have a direct impact on teacher retention and development, enabling education in the digital age to respond to the global challenges of 21st-century education.

It is recommended that schools strengthen the synergy between policy, infrastructure, and teacher capacity building through the development of consistent and adaptive long-term programmers. Local and central governments need to ensure funding commitments and regular supervision so that there is no digital access gap between educational units.

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