

MODERN TECHNOLOGY AND EDUCATIONAL GOVERNANCE: COMPARATIVE INSIGHTS FROM PAKISTAN AND FINLAND

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ABSTRACT

The study is a comparative analysis of how technology inhibits educational governance in Pakistan and Finland in order to acquire insight into best practices and relevant improvements. The first goal is to review how policy, infrastructure, and decision-making on governance with technology integration are currently stocktaking Pakistan compared to Finland; the second goal is: what needs to be filled in terms of governance gaps that do not allow good governance to prevail in the case of Pakistan when compared to Finland; and the third goal is a proposed solution(s) that could help Pakistan enhance the efficacy, inclusiveness, and accountability of. Using a mixed-methods approach, this study compares data from local and OECD sources, analyzes national reports and policy documents, and conducts semi-structured interviews with educators and educational administrators in both countries. For instance, compared to the EU average of 54%, over 80% of Finnish adults possess basic or above-basic digital skills. In terms of digital governance, Finland is a world leader. However, Pakistan remains one of the least prepared nations in South Asia for digital education, according to the Asian Development Bank's Digital Education Readiness Framework. There are significant flaws in the implementation of policies, teacher preparation, and infrastructure. The study says that Finland is the best in the world at making decisions based on data, having good digital skills, and building infrastructure. Pakistan, on the other hand, has problems with broken governance, poor connectivity, not enough digital training for teachers, and an unfair distribution of resources. It suggests that Pakistan follow Finland's best practices for digital tools, improve teacher training, make the internet more accessible, and come up with a single national digital

governance strategy to make education more efficient, accountable, and open.

Keywords: Educational Technology, Digital Education Governance, Technology In Education, Education Policy And Innovation, Smart Education Systems, E-Learning In Pakistan, Digital Transformation In Education, Finland Education System, Education Reform And Technology, Educational Reform.

Introduction

The rapid proliferation of digital technologies has transformed the global framework of education governance, influencing resource allocation, policy development, and the monitoring and enhancement of learning processes. In the last ten years, academic research has shown that technology is not neutral and does not always lead to improvements. Digitalization can either make things more fair and better or make things worse, depending on how it is governed, how well institutions can create and carry out consistent digital strategies, and the socioeconomic conditions in which it is introduced (ADB; OECD). Finland has been cited in the literature as a prime example of inclusive and systematic digitalization. National policy documents and empirical research underscore the country's extensive broadband accessibility, advanced national data systems that facilitate teacher education, and the deliberate incorporation of digital competency into teacher training frameworks that promote evidence-based decision-making and local autonomy within schools. For instance, Finland's national plan for the digitalization of education through 2027 focuses on creating sustainable, learner-centered digital ecosystems. It also says that more than 80% of adults have basic digital skills, which is much higher than the European average. This shows that the country is ready to use technology in education.

The literature regarding Pakistan depicts a fragmented and inequitable process of digital integration within the classroom. Pakistan is not ready for digital education, according to national surveys and multilateral evaluations. The Asian Development Bank says it is one of the least prepared developing countries for large-scale digital learning environments. National data and sectoral reports show that there are still differences in teacher readiness, device ownership, and connectivity. For example, internet penetration is still below global averages, and big differences between men and women and between cities and rural areas affect who can use administrative and online learning services. According to recent teacher surveys and national assessment reports, many teachers were unprepared for emergency remote teaching during the COVID-19 pandemic, and a lack of formal training in digital pedagogy continues to hinder effective technology governance.

Current research emphasizes that these divergent national paths are due to governance design rather than resource levels. Finland's model incorporates explicit equity goals, interoperable data systems, strong teacher professional development, and national guidance with local autonomy. The synergy of these elements produces favorable feedback loops that drive responsibility and creativity. With respect to the empirical research and national evaluations of teachers' practices, it is summarized that the documented growth of learner outcomes attributable to the implementation of educational technology and associated pedagogical practices can be linked to professional learning that is ongoing as well as to institutional trust. However, in

Pakistan, the absence of long-term, legally enforceable strategies for digital education, overlapping agencies, and poorly coordinated relations between federal and provincial levels have resulted in piecemeal and unscalable interventions of poorly maintained digital education. According to scholars and policy analysts, the lack of systematic governance wherein roles are clearly defined, data systems are standardized, teacher professional development is targeted, and funds are available, causes technology initiatives to be none other than isolated initiatives rather than expected transformative interventions at systems level.

Pakistan's digital education strategy is developing in several ways but there are still challenges to overcome. Government efforts to develop digital content, pilot distance education, and expand broadband infrastructure in schools are joined by donor-funded initiatives aimed at improving management information systems and teacher training. Furthermore, the rapid growth of mobile broadband and the availability of smartphones provide new opportunities for innovative, low-cost delivery systems. Nevertheless, political and regulatory issues such as inconsistent internet access, new national internet surveillance systems, and problems of privacy and access could undermine trust in official digital systems, thereby threatening continuity and equity in education.

The upcoming studies will continue to explore context-sensitive, practical approaches to improve outcomes in countries like Pakistan. These include the design of interoperable, privacy-sensitive educational data frameworks for evidence-based resource allocation and accountable governance; implementation of a single national digital educational governance framework that integrates cross-tier government responsibilities and guaranteed recurrent financing; and prioritization of resilient digital connectivity and device ownership targeted to the most disadvantaged. As a balance of ambition and pragmatism, inclusive, content-rich, pilot-to-scale approaches that integrate localized, adaptable frameworks, and infrastructure public-private collaboration are recommended. Such integrated approaches will harness the immediate technological potential to address governance challenges - enhancing educational outcomes, responsiveness, and transparency, and reducing the educational inequities entrenched in the Pakistan educational system.

This introduction provides the groundwork for a comparative analysis that incorporates recent empirical research, policy evaluations, and previous studies. For Pakistan, the adoption of Finland's systemic practices to manageable local conditions, as opposed to bringing in technical fixes while ignoring governance transformations, is the way to improved educational governance. The key argument in the following sections is that technology has the potential to enhance good governance when the three institutional elements of design, human capacity, and infrastructure are aligned.

Literature Review

The integration of modern technology into educational governance is one of the main features of 21st-century educational systems. According to UNESCO (2023), digital transformation is now a necessity rather than an option for ensuring access, transparency, and quality in governance processes. Educational governance describes all systems, strategies, and rules within and around an educational system. Van der Voet et al. (2021) describes a new model of governance, digital educational

governance, which uses technology for data-driven policy making, continuous oversight, and collaborative governance. Finland is a pioneer in the global integration of technology within educational governance. Evidence based decision making, teacher autonomy, and Finland's digital literacy make Sahlberg (2019) and Vainikainen & Hämäläinen (2022) studies very insightful. The Finnish National Agency for Education (EDUFI) developed comprehensive systems that integrate digital student records, learning analytics, and school performance tracking tools. Finland's 2017 "Smart Learning Ecosystem" project has been a game changer, providing integrated centralized data systems for municipalities, schools, and policy-makers. Over 90% of Finnish schools, according to 2022 OECD research, use digital governance systems for planning, communication, and assessment. Finland's consistent high PISA performance is no surprise.

Pakistan, on the other hand, offers a more complicated and unequal situation. Pakistan is one of the least equipped countries in South Asia for integrating technology into governance and education, according to the Asian Development Bank's Digital Education Readiness Framework (2021). Although the Digital Pakistan Vision and the National Education Policy Framework 2018 are two policy initiatives that recognize the value of ICT, Khan et al. (2022) and Ahmed & Rafi (2023) noted that implementation is still dispersed. Inadequate funding, inadequate teacher training, inconsistent data management systems, and poor digital infrastructure are the main obstacles. Only around 35% of public schools have internet access, according to the Ministry of Federal Education and Professional Training (2022), and the majority of rural institutions do not have access to digital tools for learning or governance.

Recent initiatives such as the Taleemabad Digital Learning Project, the National Education Management Information System (NEMIS), and the Smart Schools Program have made incremental progress. . Naseem & Saeed (2023) discuss how these programs constantly encounter sustainability problems due to a lack of coordination among federal and provincial authorities. Unlike Finland, where the governance of the central education system is decentralized but data systems are integrated, governance in Pakistan remains highly centralized, allowing little room for innovative ideas and gradually locked governance systems.

There is some documented evidence to indicate that Pakistan can learn from Finland as it incorporates regionally appropriate models of digital governance in accordance with the present socioeconomic scenario of the country. Collaborative governance, open data regimes, and increasing digital capacity of teachers are some of the other pursuits that could be initiated to ensure transparency, accountability, and positive governance. Consequently, existing research indicates that effective digital educational governance is only possible if human capital is integrated, there are intentional policy paths, there are robust implementation designs, and technology is used appropriately.

Results and Discussion

Finland and Pakistan have taken different routes as far as the implementation of contemporary technologies in managing the education systems is concerned. While the challenges confronting Pakistan are more systemic, administrative, and infrastructural, Finland's success is explained by its unbroken dedication to

digitization, teacher autonomy, and evidence-driven policies.

Over 95% of Finnish schools and almost 90% of teachers have championed advanced digital competencies (OECD, 2022). The pillars of the Finnish educational system are autonomy and transparency. Digital governance systems, Koski (an education data system) and Opintopolku (Studyinfo) streamline collaboration between municipalities, schools, and the state. These systems ease the decision-making process and are invaluable in sustaining accountability and inclusiveness. Finland's decentralized educational governance system allows schools to tailor digital governance systems to local requirements while meeting national goals. This enables Finland to consistently obtain the highest positions on international educational league tables. In order to maintain quality and equity in education, digital governance systems are essential.

Pakistan's educational governance structure is still evolving when it comes to digital transformation. Teacher digital literacy is still under 30% in rural areas, and only 35-40% of schools have internet connectivity (ADB, 2021, Ministry of Education, 2022). Integration of NEMIS, and Digital Pakistan Vision programs to streamline data-driven policy initiatives and modern management is inconsistently implemented and predominantly confined to donor-driven projects. Manual data collection continues in many provinces, which prevents ineffectiveness and oversight from closing. In addition, lack of a unified digital governance structure leads to fragmentation, duplication, and in effort.

Despite these challenges, the study identifies encouraging signs. Digital attendance, online teacher training, and school monitoring dashboards have yielded contextual efficiency gains in pilot projects in Punjab and Khyber Pakhtunkhwa. These projects, however, lack national oversight and are not likely to be sustained.

The dialogue highlights the importance of Pakistan's educational governance undertaking a systemic shift from project-based digitalization to a fully integrated approach. With regard to Finland's digital competence and teacher training, integrated data systems, and infrastructure developments would be vital for Pakistan. Pakistan's potential access to an open future and an effective, innovative, and technologically advanced educational sector relies on collaborative governance, equitable resource allocation, and continuous capacity building.

Comparative Overview of Educational Governance and Technology Integration in Pakistan and Finland

Differences in Finland and Pakistan's educational governance show gaps in digital readiness, infrastructure, and implementation approaches. In Finland, decentralization allows municipalities and schools considerable freedom and co-ordination at the national level through the Finnish National Agency for Education. In Finland over 95% schools have high-speed internet and 90% teachers are at least digitally literate.

Projects like Smart Learning Ecosystem and Koski and Opintopolku systems that share real-time data, transparent monitoring, and evidence-based decision-making attest to the digitization persistence of Finland eliminating educational inequity. Finland is positioned among the top three in the world for governance of digitalized education. All components of the Finnish educational paradigm demonstrate high levels of accountability, efficiency, and inclusivity through technology integration at

every stage of curriculum development, educational policy and classroom practice. Pakistan continues to manage educational governance from a more centralized perspective, showing a selective adoption of new technologies. Less than a third of teachers receive formal training in IT competencies, and even in urban areas, less than 40% of schools have internet access. The 2018 education policy and Vision Digital Pakistan (2019) frameworks advocate for the digitization of education, but the absence of vision frameworks primarily attributed to weak institutional frameworks at both the national and sub-national levels, and the inadequate inter- and intra-governmental collaboration. While the National Education Management Information System (NEMIS) continues to advance its data collection and reporting functions, the use of data to inform policy remains unsystematic, ad hoc, and unintegrated. National and sub-national initiatives on educational public-private partnerships are underdeveloped and are also unsustainable. While Khyber Pakhtunkhwa's digital learning system and the attendance monitoring system in Punjab are localized technological initiatives, they are also intended to serve as much-needed educational innovations. Education in Pakistan requires the equitable distribution of digital governance infrastructures, the training of teachers in digital pedagogy, and the rationalized digitization of governance frameworks in education. To understand how to prioritize education in Pakistan, one must study the equal digital infrastructure, consolidated digital governance frameworks, and digital pedagogical competencies of educators. Pakistan's governance frameworks in education can learn from Finland. Educational governance can become inclusive, open, and effective by developing and implementing evidence-based, decentralized governance approaches and using ICT-enabled sustainable development.

Conclusion

An analysis of the education systems of Finland and Pakistan provides insight on educational governance of the future and the importance of solid policies and inclusive systems and the integration of innovations with people. Finland is a case in point on how decentralization of education with a clear vision and sustained focus on the people of education investment pays off in terms of producing a well-governed, open, and efficient system. Educational governance in Finland emphasizes a balance between advanced governance and the use of technology and addressing people's concerns in education. Finland showcases the ability of technology to change educational outcomes with appropriate policies and equal educational resource distribution. Strong inter-agency collaboration in Finland is visible and the teaching workforce is well educated.

Pakistan, on the other hand, is in the introductory phase of the digital transformation of its education system. The Vision Digital Pakistan and NEMIS initiatives are positive first steps but the country continues to experience the effects of unprepared teachers, poor infrastructure, and weak internet connectivity. Pakistan has potential for growth given its population demographics and developing digital casystem - as long as policies, resources, and creativity are aligned. In the future, the consistent development of the country's educational system will need a comprehensive digital strategy and a movement away from scattershot, project-based methods. This will entail advancements in digital connectivity, cross-institutional collaboration, and the

infusion of digital technologies into the pedagogy of teacher education. Finnish pedagogy adds the important lesson of trust and the philosophy of learning. As Pakistan internalizes these, there is no reason why the country should not realize the digital transformation of education governance.

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