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Assessing ICT as a Catalyst for Evidence-Based Decision Making: A Theoretical Literature Review

Fazal Ali[1]*, S. P. Sreekala[2]
[1]*College of Business Management, Texila American University, Lot 2442, Plantation Providence, East Bank Demerara (EBD), Guyana, South America*
[2]*KPR College of Arts Science and Research, Coimbatore, India*

Abstract

This theoretical literature review examines the pivotal role of Information Communication Technology (ICT) as a driving force in evidence-based decision-making within educational administration. It highlights ICT's transformative potential to enhance teaching methodologies, streamline administrative operations, and foster data-driven cultures. By analyzing scholarly sources, the paper underscores the significance of ICT competence among education administrators, which encompasses the technical and analytical skills needed to interpret complex data sets and implement effective strategies. Furthermore, it emphasizes how ICT facilitates access to real-time data, promotes transparency, and improves student outcomes through personalized instruction. The review identifies critical factors influencing ICT integration and its effectiveness, including infrastructure, user capacity, and organizational culture. The paper concludes with recommendations for strengthening ICT's role in enhancing Evidence-Based Decision-Making (EBDM) in education.

Keywords: *Data Analysis, Data-Driven, Digital Tools, Educational Administration, Evidence-Based Decision Making, ICT.*

Introduction

In the ever-evolving landscape of educational administration, the integration of ICT stands as a pivotal force, reshaping decision-making processes and heralding a new era of evidence-based practices. ICT encompasses a broad spectrum of technological tools and resources, including computer hardware, software applications, digital communication networks, and the internet, all of which can be strategically leveraged to enhance the efficiency and effectiveness of educational administration. It serves as a catalyst for sustainable development by strengthening global interconnection facilities, accelerating progress through productive economic activities, and bridging the digital divide through the development of a knowledge-based society [26]. This paper explores the multifaceted role of ICT in empowering education administrators to make well-informed decisions grounded in empirical evidence, ultimately fostering improvements in educational outcomes and institutional effectiveness.

Conceptual Framework

According to Marsh & Farrell, Evidence-Based Decision Making refers to the systematic use of empirical data to guide decisions in education [22]. Information and Communication Technology encompasses a broad range of tools and systems used to collect, store, and analyze data, including Management Information Systems, Learning Management Systems, and data analytics platforms [12]. ICT competence refers to the knowledge, skills, and attitudes required for

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****Corresponding Author: fazal.fali@gmail.com***

effective use of ICT in decision-making processes. It involves not only technical proficiency but also the ability to critically evaluate and interpret data to make well-informed decisions.

This conceptual framework posits that ICT serves as a critical enabler for evidence-based decision-making in educational administration. Effective implementation of ICT tools and the cultivation of ICT competence among education administrators are essential for harnessing the full potential of data-driven decision-making. The integration of ICT can help streamline administrative processes, automate routine tasks, and provide real-time access to comprehensive data, allowing administrators to make more informed and strategic decisions. Furthermore, the ability to analyze and interpret complex data sets can lead to the identification of trends, patterns, and insights that can inform policy development and resource allocation [11]. By fostering ICT competence among education administrators, institutions can cultivate a culture of data-driven decision-making, where policies and practices are grounded in robust evidence and a commitment to continuous improvement.

ICT and Data Availability

ICT significantly enhances data availability by streamlining data collection and storage. Platforms like School Management Information Systems facilitate real-time data entry and retrieval, which are crucial for responsive decision making [10]. Studies also highlight the value of ICT in consolidating disparate data sources for comprehensive analysis [19]. The application of big data analytics and data mining techniques enables administrators to identify patterns, trends, and anomalies that would otherwise remain hidden within the data deluge. The integration of ICT into educational administration streamlines administrative processes by automating tasks such as student enrolment, attendance tracking, and grade management, thereby freeing up administrators' time to focus on strategic decision-making and policy development.

The use of ICT tools in educational institutions enables them to manage vast amounts of student and staff information, including records of student accounts, performance, progression, staff mobility, and performance [28]. This information can cover a wide range of data, such as demographics, enrolment, discipline, learning data like assessment and achievement data, teacher evaluations, and curriculum effectiveness data. Consolidating and managing this data through ICT systems provides a more comprehensive view of the educational system's inputs, resources, governance, operations, and results.

Effective utilization of ICT tools can greatly improve the efficiency and accuracy of data collection processes, ensuring that decision-makers have access to reliable and up-to-date information to support their decision-making [20]. The availability of real-time data and the ability to analyse complex data sets can empower education administrators to make more informed and strategic decisions that drive continuous improvement in educational outcomes. Furthermore, data mining techniques can be employed to extract useful information and trends from existing data, which can be used to inform the decision-making process.

ICT Competence and Decision-Making Synergies

A critical element in harnessing the power of ICT for evidence-based decision-making lies in ensuring that education administrators possess the requisite ICT competence. Administrators need to be adept at utilizing a variety of digital tools and platforms to collect, analyze, and interpret data relevant to their decision-making responsibilities [34]. The convergence of technology and pedagogy is paramount to teachers' beliefs about teaching and learning with ICT. Access to resources, software and hardware quality, ease of use, change incentives, support and collegiality in schools,

school and national policies, commitment to professional learning, and formal computer training backgrounds all influence teachers' decisions to use ICT in the classroom [27].

Furthermore, ICT competence extends beyond mere technical proficiency; it encompasses the ability to critically evaluate the quality and reliability of digital information sources. This involves discerning credible research findings from unsubstantiated claims, identifying potential biases in data sets, and applying appropriate statistical techniques to extract meaningful insights. In addition, digital competencies involve the proficient and discerning use of electronic media for professional, recreational, and communicative purposes and the aptitude to do a task with proficiency and effectiveness [7]. Effective integration of technology hinges upon teachers' attitudes, beliefs, knowledge, and skills concerning ICT. Administrators must therefore be well-equipped to conduct comprehensive evaluations of ICT interventions, meticulously assessing their impact on student learning outcomes through rigorous data analysis and statistical modeling. By nurturing ICT competence among education administrators, institutions can cultivate a culture of data-driven decision-making, where policies and practices are informed by robust evidence and a commitment to continuous improvement [27].

Leveraging ICT for Smarter School Leadership

The advent of ICT has ushered in an era of unprecedented access to educational data, presenting both opportunities and challenges for education administrators. Specifically, ICT implementation allows educational environments to be transformed into spaces where students develop diverse skills through research and problem-solving using technology-based resources. Data-driven decision-making involves the systematic collection, analysis, and interpretation of data to inform strategic decisions related to curriculum development, resource allocation, and performance management [9]. However, the mere availability of data does not guarantee effective decision-making. It is crucial that administrators possess the necessary skills and knowledge to extract meaningful insights from complex data sets and translate them into actionable strategies [24].

Fortunately, digital teaching introduces more data management capabilities, potentially fostering greater transparency and better decision-making processes for teaching and academic improvement [14]. Data visualization techniques, such as dashboards and infographics, can play a pivotal role in presenting complex information in an accessible and intuitive format, enabling administrators to quickly identify trends, patterns, and anomalies that may warrant further investigation. Moreover, administrators must be vigilant in addressing potential biases and limitations in the data, ensuring that decisions are based on a comprehensive and unbiased understanding of the educational landscape [35]. Data-driven decision-making has a substantial positive impact on student outcomes, with a synthesized effect size of 1.17 [3]. Data empowers administrators and educators to tailor instruction to meet the specific needs of individual students, resulting in significant gains in academic performance and overall student achievement [22].

ICT-supported formative evaluation offers decision-makers indispensable insights for iterative program enhancement, enabling precise diagnostic assessments and facilitating continuous performance oversight through the utilization of real-time data analytics. By analyzing data on student performance and teacher effectiveness, leaders can identify effective instructional strategies and areas where additional support may be needed [11]. Data-driven approaches promote transparency and engagement with teachers, parents, and the wider community, creating opportunities for collaboration and collective problem-solving

[11]. It is essential for educational establishments to employ diverse data sources, including standardized evaluations, attendance records, and surveys, to gain insight into student needs and institutional effectiveness [3].

Digital Pathways to Smarter Decisions

The literature consistently underscores the transformative role of information and ICT and evidence-based information in enhancing educational decision-making. ICT enables education administrators to monitor and evaluate learning outcomes more effectively, providing key insights into what is learned, how it is learned, and where and when learning occurs [25]. When properly harnessed, ICT-supported tools offer standardized methods for collecting and analyzing data, thereby supporting more informed decisions and stronger accountability [30]. The use of data to inform decision-making has become a central component of educational improvement initiatives across the globe [13].

ICT also improves management systems, particularly in schools with established data-gathering procedures [34] Educators' ability to use technology effectively in pedagogy is becoming a cornerstone of modern teaching methodologies, reshaping the learning experience [28].

The Infrastructure of Influence—Leadership and Systems

Educational systems and leadership structures play a pivotal role in supporting data-informed decision-making. Farrell's study of six secondary schools revealed how contextual factors—such as financial resources, organizational structures, and regulatory environments—either enable or hinder data-use efforts in schools [22]. However, many school systems remain focused on data collection and entry rather than meaningful analysis and application [4].

Similarly, Sutherland's four-year study in Title I schools [31] emphasized the importance of cultivating a culture of data use. Sutherland found that successful reform relies on collaboration between schools, districts, and state entities, as well as strong internal motivation to use data for continuous improvement.

To fully realize the potential of ICT and evidence-based information, educational leaders must prioritize professional development initiatives that equip administrators with the necessary data literacy skills. Educational leaders must champion a shift towards a data-driven culture, where evidence is valued and used to inform decision-making at all levels of the organization.

Building a Data-Driven Culture in Schools

Educational leaders are being urged to adopt data-driven instructional models that include stages such as data reflection, program design, formative feedback, and instructional alignment [17, 18]. However, despite the growing emphasis on data use, practical implementation remains inconsistent.

Jimerson's work identifies eight major challenges to using data in education, emphasizing that even when data is available, schools struggle with turning it into actionable insights [31, 15] adds that the promise of data use comes hand-in-hand with complexity, requiring thoughtful integration into school culture and routines.

The presence of ICT alone does not guarantee its effective use. A culture that supports data use is critical. Professional development and leadership support are key to fostering this culture [15]. Educators must also possess the requisite skills and confidence to engage with data meaningfully [21]. To foster data-informed educational districts, it is essential to address several organizational factors: cultivating shared understandings of data interpretation and application, providing

professional learning opportunities focused on effective data utilization, and strategically implementing robust computer data systems.

The Human Element - Training, Beliefs and Barriers

One consistent theme across the literature is the need for professional development. Research by Abrams et al. shows that targeted training programs can enhance teachers' data literacy, collaborative practices, and efficacy [1]. However, many programs lack clarity and focus, diminishing their impact.

Freitas & Spangenberg [13], applying the Technological Pedagogical Content Knowledge (TPACK) framework, found that while teachers often have strong content and pedagogical knowledge, their technology-related expertise lags behind. Barriers such as time constraints, inadequate infrastructure, ineffective training, and leadership weaknesses were identified as significant obstacles to ICT integration. These issues are examined through a review of research in the past decade, emphasizing that teachers' beliefs about and capacity for data use are often not connected within the literature or in practice, but they are the heart of the connection between data and instructional change [8]. Teachers' capacity to use data and their beliefs about data use are shaped within their professional communities, in training sessions, and in their interactions with coaches, consultants, and principals.

Leading the Digital Charge -The Role of Principals and Policy

Leadership commitment is frequently cited as a determining factor in successful ICT integration. Mingaine's study in Kenya highlights that school leaders who actively support ICT adoption—through budgeting, advocacy, and integration into daily management—significantly improve implementation outcomes [23]. It is imperative that principals are prepared to support and promote technology adoption among teachers and students. Principals also play a pivotal role in shaping a data-driven culture within their schools.

Effective leadership is essential in fostering a collaborative environment where data-driven decision-making is prioritized, rather than resisted. Principals need to champion the use of evidence to make strategic decisions regarding school improvement, resource allocation, and instructional practices [18].

Policy also has a critical role in shaping ICT integration in education. Policies must focus on incentivizing evidence-based practices and creating accountability measures that genuinely reflect educational outcomes [29]. Educational leaders and policymakers are encouraged to implement comprehensive training programs that focus on applied statistics, data interpretation, and the ethical implications of data use.

The findings urge leaders to stop relying solely on external aid and to take ownership by prioritizing ICT initiatives within their institutions. This includes not only infrastructure but also ongoing professional development and digital policy support. It's increasingly clear that technology leadership is not just about providing tools but about fostering a culture of innovation and continuous improvement.

Tools of the Trade – ICT for Monitoring and Management

ICT systems such as student management software, digital surveys, and online assessments powered by ICT technologies are reshaping how schools collect and use data [6, 33]. Data analytics platforms allow educators to identify patterns and gaps in student outcomes, helping them tailor instruction and policy more effectively to meet individual learner needs [33].

The Malaysian government has implemented numerous initiatives to boost ICT adoption in education, requiring schools to integrate technology into administrative tasks,

teaching, and learning [32]. This signifies the growing recognition of the potential for ICT to transform educational management and decision-making.

School Management Information Systems can also support school managers in handling complex tasks like resource allocation, strategic planning, and monitoring. Through the comprehensive analysis of information from these integrated MIS systems, administrators can gain actionable insights, thereby enhancing their decision-making capabilities. The use of ICT systems has been shown to improve communication, streamline administrative processes, and enhance overall organisational effectiveness, ultimately leading to improved educational outcomes [28].

Roadblocks on the Digital Highway

One of the primary barriers to effective ICT integration in evidence-based decision making is insufficient infrastructure. Many educational institutions, particularly in rural or under-resourced areas, lack reliable access to the internet, modern devices, and stable electricity. This digital divide creates unequal opportunities for leveraging ICT tools for data-driven practices [16]. Without the foundational infrastructure, the implementation of data collection systems, cloud-based analytics, or real-time monitoring tools becomes impractical, thereby limiting the use of technology for informed decision-making.

Another major challenge is limited digital literacy among educators and administrators. While technology may be available, many stakeholders do not possess the necessary skills to use ICT tools effectively. This skills gap inhibits the interpretation of data, utilization of management information systems, and engagement with analytics platforms. As Abrams et al. noted [1], capacity building is essential for fostering confidence and competence in data use. Training programs are often sporadic, inadequately tailored, or inaccessible, leading to underutilization of available technology and poor decision outcomes.

Resistance to change and organizational culture also represent formidable roadblocks. Introducing ICT systems often requires changes to established workflows and hierarchies, which can provoke uncertainty and skepticism among staff. Cultural norms that prioritize intuition or tradition over data can hinder the acceptance of evidence-based approaches [16]. In such environments, ICT tools are either resisted or used in a superficial manner, preventing them from becoming integral components of decision-making processes.

Moreover, data interoperability and integration issues continue to obstruct seamless ICT-enabled decision making. Educational institutions frequently use disparate systems that do not communicate well with one another, making it difficult to consolidate and analyze data holistically [9]. The lack of standardized data formats and protocols means that crucial information remains siloed, diminishing the potential insights that could be gained from a unified dataset. This fragmentation reduces the timeliness and accuracy of decisions made based on available data.

Finally, policy and governance limitations can stall progress on the digital highway. In many regions, policies around data privacy, ICT procurement, and digital innovation are outdated or inconsistently applied. As Avila et al. point out [5], the absence of clear frameworks and accountability mechanisms can lead to ad hoc implementation of ICT initiatives, undermining sustainability and scalability.

Without a supportive policy environment, even the most sophisticated technological tools may fail to translate into meaningful educational improvement.

Toward a Data-Empowered Future

The available literature paints a clear picture. ICT is not merely a tool, but rather a catalyst for change in educational leadership and

management. The integration of digital technologies enables smarter decision-making, fosters accountability, and supports a more adaptive and responsive educational system. Administrators can drive meaningful improvements in teaching, learning, and overall school effectiveness by strategically leveraging ICT and prioritizing evidence-based information. This, however, requires strong leadership, supportive policies, and an unwavering commitment to building a data-driven culture within educational institutions [28, 32].

School Management Information Systems have now become pivotal in modern education, streamlining administrative tasks, enhancing communication, and supporting data-driven decision-making [12]. These systems facilitate efficient data processing, leading to quicker and more informed decisions, thus strengthening the connection between effective information management and educational advancement. The future of educational administration lies in embracing and mastering the transformative potential of ICT and data analytics.

However, achieving these outcomes requires more than just infrastructure—it calls for a shift in mindset, leadership prioritization, strategic investment in teacher training, and a culture that values data as a tool for growth and equity.

Conclusion

ICT plays a vital role in transforming educational administration through evidence-based decision-making. By equipping administrators and educators with digital competencies and fostering a data-driven culture, schools can improve student outcomes and enhance institutional effectiveness. While barriers remain, effective leadership, robust infrastructure, and tailored professional development can drive successful ICT integration.

To fully leverage ICT in education, key recommendations include investing in infrastructure to ensure access to up-to-date digital tools and reliable internet connectivity; providing targeted professional development training in data literacy, ICT competence, and TPACK for educators and administrators; developing policies that encourage data use, transparency, and accountability; garnering leadership support to empower school leaders to prioritize and champion ICT adoption and conducting research initiatives to investigate the impact of ICT on student outcomes and develop contextually relevant strategies for integration.

The future of education administration lies in its capacity to harness technology to make informed decisions, promote continuous improvement, and ensure that every student has the opportunity to succeed in the digital age. Educational institutions that embrace this transformation will be best positioned to meet the evolving needs of students and prepare them for the challenges and opportunities of the 21st century.

Conflict of Interest

The author declares that there was no conflict of interest in the process of conducting and publishing this research work.

References

[1]. Abraham, I. A., & Alexander, P. M., 2019. ICT technology use within public health clinics. 1. https://doi.org/10.1145/3351108.3351115

[2]. Abrams, L., Varier, D., & Mehdi, T., 2020. The intersection of school context and teachers' data use practice: Implications for an integrated approach to capacity building. *Studies In Educational Evaluation*, 69, 100868. https://doi.org/10.1016/j.stueduc.2020.100868

[3]. Aburizaizah, S. J., 2021. Data-Informed Educational Decision Making to Improve Teaching and Learning Outcomes of EFL. *Journal of Education and Learning*, 10(5), 17. https://doi.org/10.5539/jel.v10n5p17

[4]. Adanne, E. F., 2024. A Meta-Analysis of Data-Driven School Leaders and School Effectiveness in the 21st Century. *Journal of Human Resource and Sustainability Studies,* 12(1). https://doi.org/10.4236/jhrss.2024.121011

[5]. Alonzo, D., Quimno, V., Townend, G., & Oo, C. Z., 2024. Using information and communication technology (ICT)-based data systems to support teacher data-driven decision-making: Insights from the literature (2013–2023). *Educational Assessment Evaluation and Accountability*. https://doi.org/10.1007/s11092-024-09443-8

[6]. Avila, E. C., Nepomuceno, R. E., & Tangalin, I. A., 2021. Exploring the Teacher's Utilization of ICT Resources in Schools and their Student's Competence in Basic Computer Applications. *Journal of Physics Conference Series*, 1933(1), 12122. https://doi.org/10.1088/1742-6596/1933/1/012122

[7]. Cai, X., Garnova, N., Filippova, Ä. A., & Glushkov, S., 2021. Intelligent Automation of Student Performance Assessment based on Cloud Services. *International Journal of Emerging Technologies in Learning (iJET)*, 16(2). https://doi.org/10.3991/ijet.v16i02.18827

[8]. Camacho, L. J., Ramírez-Correa, P., Salazar-Concha, C., & Baquero, L. A. Q., 2024. Evaluating ICT Competencies of Higher Education Faculty:A Comprehensive Quantitative Model after the Pandemic. *IBIMA Business Review*. https://doi.org/10.5171/2024.525251

[9]. Datnow, A., & Hubbard, L., 2015. Teacher capacity for and beliefs about data-driven decision making: A literature review of international research [Review of Teacher capacity for and beliefs about data-driven decision making: A literature review of international research]. *Journal of Educational Change*, 17(1), 7. Springer Science+Business Media. https://doi.org/10.1007/s10833-015-9264-2

[10]. DeFlitch, S., 2024. A Comprehensive Guide to Data-Driven Decision-Making in Education. https://www.panoramaed.com/blog/a-comprehensive-guide-to-data-driven-decision-making-in-education

[11]. Denny, M., 2020. Data-Driven Decision Making: Improving Student Achievement. https://nwcommons.nwciowa.edu/cgi/viewcontent.cgi?article=1233&context=education_masters

[12]. Fernandes, J., 2025. The Role of Data-Driven Decision-Making in Effective Educational Leadership. https://www.abacademies.org/articles/the-role-of-datadriven-decisionmaking-in-effective-educational-leadership-15998.html

[13]. Forrester, V. V., 2019. School Management Information Systems: Challenges to Educational Decision-Making in the Big Data ERA. Zenodo (CERN European Organization for Nuclear Research). https://doi.org/10.5281/zenodo.2624163

[14]. Freitas, G. de., & Spangenberg, E. D., 2019. Mathematics teachers' levels of technological pedagogical content knowledge and information and communication technology integration barriers. *Pythagoras*, 40(1). https://doi.org/10.4102/pythagoras.v40i1.431

[15]. García-Peñalvo, F. J., 2021. Avoiding the Dark Side of Digital Transformation in Teaching. An Institutional Reference Framework for eLearning in Higher Education. Sustainability, 13(4). https://doi.org/10.3390/su13042023

[16]. Garland, V. E., & Wotton, S. E., 2001. Bridging the Digital Divide in Public Schools. *Journal of Educational Technology Systems*, 30(2), 115. https://doi.org/10.2190/c22f-8tj3-9qpy-0g8v

[17]. Gummer, E. 2020. Complexity and then some: Theories of action and theories of learning in data-informed decision making. *Studies In Educational Evaluation*, 69, 100960. https://doi.org/10.1016/j.stueduc.2020.100960

[18]. Halonen, R., 2004. Resisting Technical Change — Three Case Studies. *International Journal of Innovation and Technology Management,* 1(3), 325. https://doi.org/10.1142/s0219877004000222

[19]. Halverson, R., Grigg, J., Prichett, R., & Thomas, C., 2007. The New Instructional Leadership: Creating Data-Driven Instructional Systems in School. *Journal of School Leadership*, 17(2), 159. https://doi.org/10.1177/105268460701700202

[20]. Halverson, R., Grigg, J., Prichett, R., & Thomas, C., 2015. The New Instructional

Leadership. *Journal of School Leadership*, 25(3), 447. https://doi.org/10.1177/105268461502500305

[21]. Helal, Md. S. A., Ahmed, I., & Bhuiyan, Md. E. M., 2021. Impact of Education Management Information System (EMIS) on Teaching-Learning Development. *International Journal of Academic Research in Progressive Education and Development*, 10(2). https://doi.org/10.6007/ijarped/v10-i2/10443

[22]. Kawiana, I. G. P., 2023. Utilization of Information and Communication Technology in Performance Management: For a Better Organization. *Neo Journal of Economy and Social Humanities*, 2(3), 186. https://doi.org/10.56403/nejesh.v2i3.126

[23]. Lomos, C., Luyten, J. W., & Tieck, S., 2023. Implementing ICT in classroom practice: what else matters besides the ICT infrastructure? *Large-Scale Assessments in Education*, 11(1). https://doi.org/10.1186/s40536-022-00144-6

[24]. Marsh, J. A., & Farrell, C. C., 2014. How leaders can support teachers with data-driven decision making. *Educational Management Administration & Leadership,* 43(2). https://doi.org/10.1177/1741143214537229

[25]. Mingaine, L., 2013. Leadership Challenges in the Implementation of Ict in Public Secondary Schools, Kenya. *Journal of Education and Learning*, 2(1). https://doi.org/10.5539/jel.v2n1p32

[26]. Misha, A. 2024. How Data Drives Strategies for Improved Student Outcomes. https://www.edsurge.com/news/2024-04-10-how-data-drives-strategies-for-improved-student-outcomes

[27]. Misra, S., & Bajpai, A., 2010. Role of ICT in Enhancing the Educational Productivity. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1732645

[28]. Muljono, W., Setiyawati, S., Sudarsana, S., & Setiawati, P. P., 2021. Barriers to ICT Adoption by SMEs in Indonesia: How to Bridge the Digital Disparity? *Jurnal Aplikasi Manajemen*, 19(1), 69. https://doi.org/10.21776/ub.jam.2021.019.01.07

[29]. Mumtaz, S., 2000. Factors affecting teachers' use of information and communications technology: a review of the literature [Review of Factors affecting teachers' use of information and communications technology: a review of the literature]. *Journal of Information Technology for Teacher Education*, 9(3), 319. Taylor & Francis. https://doi.org/10.1080/14759390000200096

[30]. Mwadulo, M. W., & Odoyo, C. O., 2020. ICT Adoption in the Educational Management of Primary Schools in Kenya. *Universal Journal of Communications and Network*, 8(1). https://doi.org/10.13189/ujcn.2020.080101

[31]. Ntorukiri, T. B., Kirugua, J. M., & Kirimi, F., 2022. Policy and infrastructure challenges influencing ICT implementation in universities: a literature review [Review of Policy and infrastructure challenges influencing ICT implementation in universities: a literature review]. Discover Education, 1(1). *Springer Science+Business Media*. https://doi.org/10.1007/s44217-022-00019-6

[32]. Schildkamp, K., & Datnow, A. 2020. When Data Teams Struggle: Learning from Less Successful Data Use Efforts. Leadership and Policy in Schools, 21(2), 147. https://doi.org/10.1080/15700763.2020.1734630

[33]. Shen, J., & Cooley, V. E., 2008. Critical issues in using data for decision-making. *International Journal of Leadership in Education*, 11(3), 319. https://doi.org/10.1080/13603120701721839

[34]. Singh, T. K. R., & Muniandi, K., 2012. Factors Affecting School Administrators' Choices in Adopting ICT Tools in Schools – The Case of Malaysian Schools. *International Education Studies*, 5(4). https://doi.org/10.5539/ies.v5n4p21

[35]. Stefanakos, E., 2023. Mastering Student Data Tracking: Key Metrics and Best Practices. https://analyticvue.com/student-data-tracking

[36]. Sutherland, S., 2004. Creating a Culture of Data Use for Continuous Improvement: A Case Study of an Edison Project School. *American Journal of Evaluation*, 25(3). https://doi.org/10.1177/109821400402500302

[37]. Timotheou, S., Miliou, O., Dimitriadis, Y., Villagrá-Sobrino, S., Giannoutsou, N., Cachia, R., Martínez-Monés, A., & Ioannou, A., 2022. Impacts of digital technologies on education and factors influencing schools' digital capacity and

transformation: A literature review [Review of Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review]. *Education and Information Technologies*, 28(6), 6695. Springer Science+Business Media. https://doi.org/10.1007/s10639-022-11431-8

[38]. Zeide, E., 2017. The Structural Consequences of Big Data-Driven Education. *Big Data*, 5(2). https://doi.org/10.1089/big.2016.0061