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Developing Digital Literacy Strategy in Higher Education Institutions

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Abstract

In an increasingly digital world, the ability to effectively navigate and utilize digital technologies is paramount. Digital literacy (DL) has emerged as a crucial competency, not just in personal and professional spheres but also within the academic environment. Indeed, higher education institutions (HEIs) are at the forefront of this transformation, as they are responsible for equipping students with the necessary skills to thrive in a digital economy. Thus, this article explores the development of a comprehensive DL strategy in HEI. Examining the importance of DL has made this article founds several factors such as enhancing employability, supporting academic achievement, promoting lifelong learning, and fostering inclusive education. Further, this article reveals that key components of DL include vision and goals, curriculum integration, practitioner professional development, digital resources and infrastructure, student support services besides assessment and evaluation. Inevitably, this article founds major challenges such resistance to change, resource constraints, diverse skill level, rapid technological advancements, ensuring accessibility. Nevertheless, to encounter the issues of DL, establish a clear vision and goals, integrate digital literacy across the curriculum, investment in professional development, provide robust digital resources and infrastructure, offer comprehensive student support services, promote digital citizenship and ethical use, implement continuous assessment and evaluation, address barriers to access become the forefront of recommendation for best practices in DL around the globe.

Keywords: *digital literacy, higher education institution, component, challenges, recommendation*

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1. INTRODUCTION

In today's digitally connected world, the educational landscape is continuously changing. Digital literacy (DL) or the capacity to explore, understand and utilize digital technologies effectively has become an essential skill for students, academics, and administrators. Indeed, higher education institutions (HEI) are always in positioned to drive this shift by designing and executing comprehensive digital literacy programs. Such strategies not only improve academic and professional achievements yet further promote lifelong learning and inclusiveness.

Indeed, DL is more than just digital technical proficiency; it encompasses a broad range of competencies including critical thinking, ethical use of digital information as well as effective communication in digital spaces (Reininger and Karbginsky, 2021). As the digital divide becomes more apparent, indeed, HEIs have a responsibility to ensure that all students, regardless of their background, be capable of developing these essential skills. Not to mention, a well-crafted digital literacy strategy bridging this gap, providing equitable access to digital tools and resources.

Therefore, the importance of digital literacy in higher education cannot be overstated. In student setting, digital literacy is integral to academic success. It enables students in HEI to conduct research more efficiently, collaborate with peers on digital platforms, and engage with interactive learning materials (Santos and Serpa, 2017).

In the professional realm, undeniably, employers increasingly search for students that are proficient with digital tools and technologies, capable of data analysis, and knowledgeable in digital communication (Bejakovic and Mrnjavac, 2020). Thus, providing students with robust DL abilities boosts their job readiness and prepares them to meet the demands of the digital workplace (Falloon, 2020).

However, building a DL strategy imposes the implementation of critical components. Primarily, HEIs must define an unclouded vision and set feasible targets that remain consistent with the institution's overarching educational objectives (Yoleri and Anadolu, 2022). Integrating digital literacy into the curriculum is critical for imparting such skills across disciplines.

At the same time, professional development in higher education is particularly critical since academics and administrators must be digitally adept to effectively educate and serve students (Scherer, 2021). Furthermore, HEIs must invest in digital resources and infrastructure to guarantee that every key player, such as administrators, academics, and students, could utilize the most recent devices, software, and high-speed internet connections (Audrin and Audrin, 2022).

Moreover, student support services are vital in encouraging DL in college and university settings. Workshops, coaching, and online resources designed to meet a variety of learning requirements tend to assist students in developing trust as well as proficiency with digital technologies. further, regular assessment and evaluation must take place to measure the effectiveness of the digital literacy approach as well as implement data-driven changes (Antonietti et al., 2022).

Nonetheless, establishing and implementing a digital literacy strategy is not without challenges. Resistance to change, resource limits, diverse skill levels among students and staff, and the rapid speed of technological improvements all provide important challenges. In this context, HEIs must address these problems by open communication, investment prioritization, and a commitment to ongoing learning and adaptation (Belessovam et al, 2022).

Eventually, the best practices for developing a digital literacy strategy include engaging stakeholders in the planning process, creating collaborative learning environments, leveraging data and analytics for decision-making, and promoting digital citizenship (Morgan et al., 2022). By fostering a culture of digital collaboration and ethical use of technology, HEIs can create an environment where digital literacy flourishes and succeeds.

Simply put, a well-developed DL plan is critical for HEIs to remain relevant and effective in the twenty-first century. Prioritizing digital literacy might assist HEIs in increasing academic success, employability, lifelong learning, and ensuring equitable educational opportunities. The journey to DL is constant and requires commitment, innovation, and collaborative efforts. As institutions embrace this challenge, it will not only prepare the students for the future but additionally foster a more technologically literate and diverse society.

2. IMPORTANCE OF DIGITAL LITERACY IN HIGHER EDUCATION

In an era of rapid technological advancement, DL has emerged as an essential ability in HEIs. In this setting, DL implies the capacity to successfully and critically access, assess, and generate information using a variety of digital tools. Such abilities ought to be optional for students, academics, and administrators; they are mandatory. Without a doubt, the significance of DL in HEIs is diverse, affecting academic achievement, employability, lifelong learning, and the whole educational experience.

More importantly, DL is an important predictor of employment in this generation's workforce. Employers across industries prefer graduates who have not only conventional academic knowledge but also the ability to successfully utilize digital tools and platforms proficiently.

Data analysis, digital communication, and adaptability to innovative technologies constitute all exceptionally valued skills in today's job market around the globe (Tuychi, 2020).

Therefore, HEIs must embark on developing students to fulfill such expectations by promoting digital literacy to make them more marketable and fulfill the demands of industries. In fact, graduates who are digitally literate will be better positioned for professional success in career development since DL skills allow them to confidently negotiate the challenges of a digital work environment (Yadav, 2024).

Digital literacy remains paramount to students' prospects in higher education. Administrators and personnel from academia who have proficiency with digital technology may further develop the way they educate, engage, and prepare students more effectively, and streamline administrative processes. Thus, it serves to create a more dynamic and efficient educational environment, which benefits all students by combating DL in higher education institutions.

Enhancing Employability

DL is an essential employment skill. Employers from a variety of industries demand graduates who can utilize digital tools and platforms, analyze, and interpret data, and interact with digital material. In this context, DL refers to an individual's employability equipped by a set of factors and processes that allow people to find employment, preserve employment, or succeed throughout the job market. Technological DL within work environments involves utilizing digital devices (smartphones, computers, and tablets) to connect to online resources to discover, create, examine, evaluate, and apply information spanning digital platforms. By encouraging DL, HEIs may improve their graduates' employability and guarantee that they remain competitive in the job marketplace (Vrana, 2016).

Supporting Academic Achievement

One of the key reasons for the importance of DL in HEI is its direct impact on academic success. In this setting, DL allows students to access and analyze information, participate in online learning platforms, and collaborate digitally. Today's HEI setting is increasingly digital, with internet-based materials, digital textbooks, virtual classrooms, and e-learning platforms becoming commonplace. Students who have become proficient in DL are better able to access and utilize such resources efficiently. They might undertake more effective research, interact with interactive learning resources, and collaborate with peers and instructors online. This improves the way they learn and enables them to obtain greater academic achievement (Apps et al., 2021).

Promoting Lifelong Learning

DL is an essential element of continuous education and will become a vital component of personal and professional growth in the twenty-first century. The digital age is one of perpetual development, with innovative technology and approaches developing on a regular basis. Individuals who are digitally literate are more adaptive and can learn and refresh their abilities on a regular basis. Higher education institutions play a significant role in establishing adaptability and promoting a lifelong learning mindset. By emphasizing DL, it provides students with the tools and attitudes they need to stay current and engaged in an ever-changing world (Khan et al., 2022).

Fostering Inclusive Education

DL encourages inclusive education by giving students access to a multitude of online resources and learning opportunities. It allows students from a variety of backgrounds, including those with disabilities, to actively participate in the learning process. Accessible digital tools and resources may contribute to narrowing the learning gap and promoting equal outcomes. For example, digital textbooks can be less expensive than traditional textbooks, and online courses can reach students who do not have access to a physical campus. Prioritizing digital literacy allows HEIs to guarantee that every student, irrespective of situation, has a chance to successfully accomplish DL (Radovanovic, 2023).

Briefly, the significance of DL in HEIs cannot be put at stake by everyone around the globe. It is an essential component of academic performance, employability, lifelong learning, and inclusive education. As the digital landscape evolves, higher education institutions must prioritize the development of digital literacy skills among students, teachers, and staff. This not only improves educational quality but also prepares graduates to flourish in a digitally driven environment. The commitment to promoting digital literacy is an investment in the future, ensuring that people are prepared to face the challenges and opportunities of the twenty-first century with competence and confidence.

3. KEY COMPONENTS OF A DIGITAL LITERACY STRATEGY

In the digital age of the present, DL has become particularly significant to higher education institutions. This is owing to an increased awareness of the urgency of equipping students with the skills needed to properly navigate as well as exploit digital technology. As a result, a well-planned digital literacy approach is essential for developing such abilities. Understanding the fundamental components of such a plan is critical to its successful execution and the overall development of digitally proficient individuals.

Vision and Goals

Unambiguous objectives and well-defined goals are the core of every successful DL approach. The vision should be consistent with the institution's overall mission and educational goals, emphasizing the value of DL in improving learning, teaching, and operational operations of HEIs. Goals should be specific, measurable, attainable, relevant, and time-bound (SMART), with a clear roadmap for achieving the strategy's objectives. This clarity guarantees that all stakeholders, including students, staff, and administrators, agree and dedicated to the strategy's success (Shopova, 2014; Akil and Adnan, 2022).

Curriculum Integration

Integrating digital literacy into the curriculum is necessary and will become a critical component. HEI should have components that teach and test digital skills including data analysis, digital communication, and online research. This entails integrating digital abilities across disciplines and ensuring that students develop such abilities gradually (Palomino and Torres, 2023). In this context, DL should be included in the academic curriculum across many domains rather than being limited to separate courses.

This entails integrating digital skills and abilities into course content, assignments, and assessments. For example, students in the research methodology class can undertake investigations utilizing digital archives and tools, but those in the business class may analyze data using spreadsheet software (Ahmad et al., 2023). By incorporating DL into a variety of topics, students can learn and apply such abilities in real-world settings.

Practitioner Professional Development

Professional development for academics and administrators is critical to the success of any DL strategy. In fact, to effectively impart knowledge and assist students, academics require being proficient with digital technology (Alazemi, 2022). Continuous professional development programs should be put in place to strengthen academic and administrative digital competencies. Workshops, online courses, and collaborative learning communities are examples of programs in which educators share the best practices and resources. By equipping academics and administrators with the necessary skills and competence, HEIs ensure that digital literacy is properly taught and modelled (Haarala-Muhonen et al., 2023).

Digital Resources and Infrastructure

Access to digital materials and a strong infrastructure are crucial. In fact, a comprehensive DL initiative necessitates robust digital resources and infrastructure. This involves offering access to the latest hardware, software, and high-speed internet. Furthermore, digital libraries, online databases, and e-learning platforms should be easily accessible to facilitate teaching, learning, and research (Nagari et al., 2023). Investing in technological infrastructure ensures that students and staff have seamless access to digital resources, in addition to developing and employing digital skills to promote DL in HEI.

Student Support Services

Supporting students' digital literacy improvement plays a vital role throughout HEI. In this context, personalized assistance entails delivering focused services such as workshops, tutoring, and internet resources. Such resources should serve a wide range of learning needs and be easily accessible for students, with the goal of helping them develop confidence and skills in using digital tools and technology. Offering workshops on effective online research skills or digital content creation, for example, can help students engage with digital technology more meaningfully (Md. Yusof et al., 2023).

Assessment and Evaluation

Regular assessment and evaluation are essential for evaluating the performance of the DL strategy, and they should be carried out to measure students' digital competencies as well as the integration of DL into the curriculum. This includes assessing students' skills in digital technology, estimating the inclusion of online literacy in the educational environment, and requesting feedback from stakeholders to support continuous improvement efforts. This iterative process ensures that the strategy remains relevant and effective in accomplishing its objectives over time (Nguyen and Habok, 2024).

In a nutshell, the core components of a DL strategy—clear vision and goals, curriculum integration, ongoing professional development, robust resources and infrastructure, student support services, and regular assessment and evaluation—are required for accomplishment. By focusing on these elements, HEIs may create holistic plans that improve DL, educate students for the future, and contribute to a more technologically competent society.

Though overcoming challenges such as resistance to change, resource constraints, and diverse skill levels necessitates strategic planning and a commitment to continuous learning and adaptation, institutions must explicitly convey the benefits of DL, prioritize investments, and address the diverse needs of students, academics and administrators in HEI.

4. CHALLENGES IN DEVELOPING A DIGITAL LITERACY STRATEGY

In the digital age, HEIs bear the critical obligation of encouraging DL among students, academics and administrators. Creating a thorough DL strategy is critical for ensuring that everyone has the skills to explore, evaluate, and utilize digital technology effectively. However, developing and implementing such a strategy has significant challenges. Understanding these challenges is critical for HEIs to embark on robust and efficient DL efforts.

Resistance to Change

One of the most difficult and major problems in building a DL strategy is resistance to change. Many HEI academics and students may be accustomed to old-fashioned methods of teaching and learning and are hesitant to adopt new technologies. This resistance can be attributed to a lack of experience with digital technologies, a fear of the unknown, or concerns about the potential disruptions that technological integration may bring. Overcoming this issue necessitates clear communication about the benefits of DL, as well as training and support to facilitate the transition (Bueno et al., 2023).

Resource Constraints

Another key impediment is resource limits, which might make DL approach costly. Implementing a DL strategy sometimes necessitates a significant financial investment in technology infrastructure such as computers, software, and high-speed internet access. HEIs may encounter financial limits when it comes to procuring necessary technology, offering professional development, and promoting digital initiatives. Prioritizing investments and finding external finance might mitigate the issue at hand. Professional development programs require additional funds to guarantee that academics and staff are adept in the use of digital tools. Many HEIs, in fact, particularly those with low budgets, struggle to devote enough resources to achieving these goals. Creative alternatives, such as obtaining external finance,

forging alliances with technology businesses, or utilizing open-source tools, might minimize these financial constraints (Mokhtari, 2023).

Diverse Skill Level

The diversity and changing skill levels of students as well as academics hamper the creation of a DL strategy. Typically, students enter higher education institutions with various levels of digital proficiency, impacted by their prior educational experiences, socioeconomic backgrounds, and personal exposure to technology. Addressing this variety necessitates differentiated training and tailored learning strategies. HEIs must build flexible programs that appeal to both beginners and advanced users, allowing everyone to learn at their own speed while also developing the necessary DL competencies (Fedeli and Tomczyk, 2022).

Rapid Technological Advancements

Keeping up rapid technological improvements is another difficult challenge. Keeping DL curricula and resources up to current is challenging because to the rapid rate of technology changes. The digital landscape is continually changing, with new tools, platforms, and approaches being introduced on a regular basis. HEIs must stay current with these changes to ensure that their DL programs remain relevant and effective. This demands a constant review and update process, which includes regular feedback from stakeholders and ongoing study into emerging trends. To effectively deal with the dynamic of developing technologies and changes and remain relevant in the digital age, HEIs must foster a culture of constant learning and adaptability (Bashar and Naaz, 2024).

Ensuring Accessibility

Ensuring accessibility and inclusivity in DL efforts is critical, but difficult. Digital tools and resources must be available to all students, including those with disabilities. This necessitates adherence to accessibility standards and the use of assistive technologies. Institutions must also address the digital gap by ensuring that all students, regardless of socioeconomic position, have access to the appropriate technology and internet connectivity. Support services, such as device lending programs and access to low-cost internet connections, might narrow the gap (Mokhtari, 2023).

To put it simply, creating a DL strategy in HEI is a diverse and difficult task. Resistance to change, limited resources, a wide range of skill levels, rapid technological improvements, and the requirement for accessibility and effective assessment are all key challenges that institutions must overcome.

Understanding and tackling such challenges enables HEIs to put together extensive and effective digital literacy initiatives that empower students and academics with the fundamental abilities that are required to flourish in a digital world. HEIs can overcome these barriers by prioritizing clear communication, strategic investment, customized instruction, ongoing learning, and diversity.

5. RECOMMENDATION FOR DEVELOPING A DIGITAL LITERACY STRATEGY

In the twenty-first century, DL has become an essential component of successful education. As technology transforms how information is accessible, shared, and applied, HEIs must implement comprehensive digital literacy programs. Such approaches have become essential for providing students with the necessary abilities to navigate and prosper in a digitally linked society. Developing an effective DL initiative necessitates an exhaustive strategy that incorporates several critical components and addresses frequent issues. The following offers a few key recommendations for developing an effective DL strategy in HEI.

Establish a Clear Vision and Goals

The core of any successful DL strategy is a clear vision and well-defined goals. This vision should be consistent with the institution's overall mission and educational goals, emphasizing the importance of DL in improving learning, teaching, and research. As previously stated, DL initiatives should be specified, measurable, achievable, relevant, and time-bound (SMART) to provide a disciplined framework for implementation. This clarity ensures that all stakeholders understand and support the strategy's goals, supporting a coordinated effort toward DL (Murray et al., 2022).

Integrate Digital Literacy Across the Curriculum

DL should not be limited to individual classes, but rather integrated across the curriculum. Embedding digital skills and competencies across disciplines guarantees that students may apply these abilities in a variety of scenarios. Humanities students, for example, may learn how to conduct research using online databases, whereas scientific students might employ statistical software. This comprehensive strategy guarantees that DL becomes an integral part of all academic endeavors, equipping students for the diverse demands of the modern workforce (Quraishi et al., 2023).

Investment in Professional Development

To effectively implement DL, educators must be familiar with digital technologies and pedagogies. Continuous professional development programs are vital for improving academics or 's skills in the digital realm. Such initiatives may include workshops, webinars, online

courses, and collaborative learning communities during which educators can share best practices and resources. By providing educators with the appropriate skills and expertise, HEIs may ensure that digital literacy is effectively taught and modelled (Adipat et al., 2023).

Provide Robust Digital Resources and Infrastructure

Access to current digital materials and infrastructure is critical to fostering DL. This includes providing students and academics with reliable hardware, software, and high-speed internet access. Digital libraries, online databases, and e-learning platforms should be easily accessible to support teaching, learning, and research activities. Investing in robust technological infrastructure ensures that the academic community has the resources it needs to develop and apply digital skills successfully (Mokhtari, 2023).

Offer Comprehensive Student Support Services

Targeted student support services are essential for increasing DL. Workshops, coaching, tutoring and online resources matched to different learning requirements might assist students build confidence and skill with digital tools. HEIs should make sure that such resources become accessible to all students, particularly those from underprivileged backgrounds. Sessions on effective online research practices, digital content creation, and cybersecurity could assist students with engaging with digital technologies in meaningful ways (Stephen and Elia, 2024).

Promote Digital Citizenship and Ethical Use

Digital literacy is more than just technical skills; it also includes comprehending the ethical consequences of digital use. Promoting digital citizenship involves educating students about online safety, privacy, digital etiquette, and responsible utilization of digital resources, as well as the consequences of the digital footprint they leave. This comprehensive approach assures that students not only become proficient users of technologies, but also conscientious and ethical digital citizens (Amhag et al., 2019).

Implement Continuous Assessment and Evaluation

Ongoing monitoring and assessments serve as essential for figuring out the effectiveness of the digital literacy strategy. HEIs should provide exact and valid assessment techniques to measure students' digital competencies and integrate DL into the curriculum. Gathering feedback from students, faculty, and other stakeholders may aid towards continual improvement, ensuring the overall strategy pertinent and efficient (Viberg et al., 2024).

Address Barriers to Access

Providing all students with access to the essential technology and resources is critical for an inclusive DL strategy. HEIs could bridge the digital gap by offering services such as device lending initiatives and adequate connectivity to the internet. By addressing these impediments, HEIs might develop a fair learning environment in which every academic, administrator and student is capable of achievement (Afzal et al., 2023).

Ultimately, developing a digital literacy strategy necessitates a thorough and diversified approach. Higher education institutions may implement innovative and inclusive digital literacy strategies by defining a concise objective, integrating digital literacy into the curriculum, investing in professional development, providing robust resources, providing student support, fostering digital citizenship, implementing continuous assessment, and addressing obstacles to accessibility. These initiatives will provide students with the necessary abilities to succeed in an increasingly digital world, preparing them for academic achievement and future professions.

6. CONCLUSION

Developing a DL strategy for HEIs is a diverse and dynamic process that involves comprehensive formation, stakeholder interaction, and ongoing development. Prioritizing DL might aid HEIs improve employment, academic achievement, lifelong learning, and inclusive education. An unclouded vision, curriculum integration, professional development, sturdy infrastructure, student support services, and continuous evaluation are the essential elements of a successful plan. Despite challenges such as resistance to change, resource constraints, and varying skill levels, best practices such as stakeholder engagement, collaborative learning environments, data-driven decision-making, and promoting digital citizenship may result in a successful and impactful DL strategy. Based on the ocean of literature review, HEIs around the world recognize the importance of DL and have begun taking initiative-taking steps to include it throughout the curriculum frameworks, preparing students for a digitally driven future.

References

Afzal, A., Khan, S., Daud, S., Ahmed, Z. & Butt, A. (2023). Addressing the digital divide: access and use of technology in education. *Journal Of Social Sciences Review*, 3(2), 883-895 3. 883-895. http://doi.org/10.54183/jssr.v3i2.326.

Ahmad, R., Mehmood, S. T. & Ijaz S. (2023). Digital literacy competencies: A study of distance learners of higher education regulatory authority Khyber Pakhtunkhwa. *Pakistan Journal of Distance & Online Learning*, 9(1), 82-96. Retrieved from https://files.eric.ed.gov/fulltext/EJ1401028.pdf.

Akil, W. F. H. W. M., & Adnan, A. H. M. (2022). Promoting digital literacy in higher education: Case study of a medical laboratory program in Malaysia. *International Journal of Academic Research in Progressive Education and Development*, 11(4), 735–755. http://doi.org/10.6007/IJARPED/v11-i4/15906

Alazemi, N.F.S.A. (2022). The impact of digital learning resources on developing the educational process for faculty members at the PAAET. *Amazonia Investiga*, 11(59), 54-63. https://doi.org/10.34069/AI/2022.59.11.5

Amhag, L., Hellström, L., & Stigmar, M. (2019). Teacher educators' use of digital tools and needs for digital competence in higher education. *Journal of Digital Learning in Teacher Education*, 35(4), 203–220. https://doi.org/10.1080/21532974.2019.1646169

Apps, T., Agostinho, S. & Bennett, S. (2021). Maybe it's the environment you grow up in?' Australian primary school students' reflections on their school-based digital literacy. *Technology, Pedagogy and Education*, 31(2), 231-246. https://doi.org/10.1080/1475939X.2021.1973550

Audrin, C., & Audrin, B. (2022). Key factors in digital literacy in learning and education: A systematic literature review using text mining. *Education and Information Technologies*, 27(6), 7395–7419. https://doi.org/10.1007/s10639-021-10832-5

Antonietti, C., Cattaneo, A., & Amenduni, F. (2022). Can teachers' digital competence influence technology acceptance in vocational education? *Computers in Human Behavior*, 132, 107266. https://doi.org/10.1016/j.chb.2022.107266

Adipat, S., Chotikapanich, R., Laksana, K., Busayanon, K., Piatanom, P., Ausawasowan, A., & Elbasouni, I. (2023). Technological pedagogical content knowledge for professional teacher development. *Academic Journal of Interdisciplinary Studies*, 12(1), 173. https://doi.org/10.36941/ajis-2023-0015

Bashar, U. & Naaz, I. (2024). digital literacy: the importance, initiatives and challenges. *International Research Journal of Modernization in Engineering Technology and Science*, 6(5), 6218-6223. https://doi.org/10.56726/IRJMETS56658.

Bejakovic, P. & Mrnjavac, Z. (2020). The importance of digital literacy on the labour market. *Employee Relations*, 42(4), 921-932. https://doi.org/10.1108/ER-07-2019-0274

Belessova, D., Ibashova, A., Bosova, L. & Shaimerdenova, G. (2023). Digital learning ecosystem: Current state, prospects, and hurdles. *Open Education Studies*, 5(1), 1-8. https://doi.org/10.1515/edu-2022-0179

Bueno, R., Niess, M. L., Aldemir Engin, R., Ballejo, C. C., & Lieban, D. (2023). Technological pedagogical content knowledge: Exploring new perspectives. *Australasian Journal of Educational Technology*, 88–105. https://doi.org/10.14742/ajet.7970

Cabero-Almenara, J., Gutiérrez-Castillo, J.-J., Barroso-Osuna, J., & Palacios-Rodríguez, A. (2023). Digital Teaching Competence According to the DigCompEdu Framework. Comparative Study in Different Latin American Universities. Journal of New Approaches in Educational Research, 12(2), 276. https://doi.org/10.7821/naer.2023.7.1452

Falloon, G. (2020). From digital literacy to digital competence: the teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68(5), 2449–2472. https://doi.org/10.1007/s11423-020-09767-4

Fedeli, L. & Tomczyk, L. (2022). *Digital literacy for teachers*. Singapore: Springer Nature Singapore.

Haarala-Muhonen, A., Myyry, L., Pyörälä, E., Kallunki, V., Anttila, H., Katajavuori, N., Kinnunen, P., & Tuononen, T. (2023). The impact of pedagogical and ICT training in teachers' approaches to online teaching and use of digital tools. *Frontiers in Education*, 8. https://doi.org/10.3389/feduc.2023.1223665

Khan, N., Sarwar, A., Chen, T. B., & Khan, S. (2022). Connecting digital literacy in higher education to the 21st century workforce. *Knowledge Management & E-Learning*, 14(1), 46–61. https://doi.org/10.34105/j.kmel.2022.14.004

Md Yusof, Z., Misiran, M., Jun, L. Q., Quan, G. H., Sobri, A. H. & Mahmud, N. A. (2023). A survey of digital literacy among students of foundation studies in management: A case study in public higher institution Malaysia. *Jurnal Perspektif*, 15(1), 55-66. Retrieved from https://repo.uum.edu.my/id/eprint/30861/1/JP%2015%2001%202023%2055-66.pdf.

Mokhtari, F. (2023). Fostering digital literacy in higher education: Benefits, challenges and implications. *International Journal of Linguistics, Literature and Translation*, 6(10),160-167. https://doi.org/10.32996/ijllt.2023.6.10.19.

Morgan, A., Sibson, R., & Jackson, D. (2022). Digital demand and digital deficit: conceptualizing digital literacy and gauging proficiency among higher education students. *Journal of Higher Education Policy and Management*, 44(3), 258-275. https://doi.org/10.1080/1360080X.2022.2030275

Murray, M., Pérez, J. & Fluker, J. (2022). Digital literacy in the core: The emerging higher education landscape. *Issues in Informing Science and Information Technology*, 19, 1-13. https://doi.org/10.28945/4957.

Nagari, P., Sahid, S. & Hussin, M. (2023). Critical success factors for enhancing digital literacy among undergraduate students. *Pegem Journal of Education and Instruction*, 13(4), 249-259. https://doi.org/10.47750/pegegog.13.04.30.

Nguyen, L. A. T., & Habók, A. (2024). Tools for assessing teacher digital literacy: A review. *Journal of Computers in Education*, 11(1), 305–346. https://doi.org/10.1007/s40692-022-00257-5

Palomino, M. & Torres, Á. (2023). Digital literacy in university students of education degrees in Ecuador. *Frontiers in Education*. 8(11), 1-8. https://doi.org/10.3389/feduc.2023.1299059.

Quraishi, T., Ulusi, H., Moihd, A., Hakimi, M. & Olusi, M. (2023). Empowering students through digital literacy: A case study of successful integration in a higher education curriculum. *Journal of Digital Learning and Distance Education*, 2(8), 668-681. https://doi.org/10.56778/jdlde.v2i8.208.

Radovanovic, D. (2023). *Digital literacy and inclusion: Stories, platforms, communities*. Switzerland: Springer International Publishing.

Reininger, M. & Karbginsky, D. (2021). *Digital literacy*. New York: Chemeketa Press.

Santos, A. I. & Serpa, S. (2017). The importance of promoting digital literacy in higher education. *International Journal of Social Science Studies*, 5(6), 90-93. https://doi.org/10.11114/ijsss.v5i6.2330.

Scherer, R., Howard, S. K., Tondeur, J., & Siddiq, F. (2021). Profiling teachers' readiness for online teaching and learning in higher education: Who's ready? *Computers in Human Behavior*, 118, 106675. https://doi.org/10.1016/j.chb.2020.106675

Shopova, T. (2014). Digital literacy of students and its improvement at the university. *Journal on Efficiency and Responsibility in Education and Science*, 7(2), 26-32. https://doi.org/10.7160/eriesj.2014.070201.

Stephen, N. & Elia, E. (2024). Students' digital literacy skills for learning in selected Tanzania's public universities. *Cogent Education*, 11(1), https://doi.org/10.1080/2331186X.2024.2355350.

Tuychi, J. (2020). Use of Digital Learning Technologies in Education on the Example of Smart Education. *Journal La Edusci*, 1, 33-37. Retrieved from https://www.researchgate.net/publication/347588947_Use_of_Digital_Learning_Technologies_in_Education_on_the_Example_of_Smart_Education/citation/download.

Viberg, O., Mutimukwe, C., Hrastinski, S., Cerratto Pargman, T. & Lilieskӧld, J. (2024). Exploring teachers' (future) digital assessment practices in higher education: Instrument and model development. *British Journal of Educational Technology*, 1(1), 1-20. https://doi.org/10.1111/bjet.13462.

Vrana, R. (2016). Digital literacy as a boost factor in employability of students. *Communications in Computer and Information Science*. 676. 169-178. https://doi.org/10.1007/978-3-319-52162-6_17.

Yadav, N. (2024). The impact of digital learning on education. *International Journal of Multidisciplinary Research in Arts, Science and Technology*, 2(1), 24-34. https://doi.org/10.61778/ijmrast.v2i1.34

Yoleri, S. & Anadolu, Z. N. (2022). Examination of digital literacy skills of undergraduate students according to various variables. Advanced Education, 21, 121-134. https://doi.org/10.20535/2410-8286.262190