

Digital Citizenship and Knowledge Management in Education: Strategic Pathways to Sustainable Development

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ABSTRACT:

The article examines the relationship between digital citizenship and knowledge management as key factors in sustainable development within the context of the digital transformation of education. Knowledge management in the digitalization of education refers to the systematic process of creating, preserving, disseminating, and effectively using information and educational resources through digital technologies to develop sustainable skills and competencies essential for societal progress. Digital citizenship encompasses the rights, responsibilities, and competencies required for active participation in the digital environment, ensuring engagement in public life through the use of digital educational technologies. It includes digital literacy, ethical online behavior, safe use of digital resources, and the ability to critically evaluate and create digital content. In conjunction with knowledge management, digital citizenship plays a pivotal role in the dissemination, storage, and application of information. Knowledge management enables the systematization of large data sets and the creation of digital educational platforms that enhance citizens' awareness and participation in social processes. The digitalization of education provides the foundation for developing digital citizenship by fostering the necessary skills and competencies for effective interaction in the digital space. It promotes open access to knowledge, advances e-learning, personalizes educational processes, and prepares individuals for the efficient use of digital resources. At the same time, the authors emphasize the risks posed by the digital divide, cybersecurity threats, and the urgent need to cultivate digital competencies.

Keywords: digital citizenship, identity, knowledge management, communication, sustainable development, knowledge society, civic education, digitalization of education, digital divide, digital competencies

1. Introduction

In today's world, knowledge serves as a strategic resource for sustainable development, as the effective utilization of humanity's intellectual potential is becoming a

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key factor in achieving economic and social sustainability. In this context, a high-quality knowledge management system enables the most efficient creation, preservation, dissemination, and application of information to support decision-making that fosters sustainable development. With the increasing digitalization of education, knowledge management is seen as a process of creating, storing, sharing, and using educational resources and competencies through digital technologies to ensure quality, accessible, and inclusive learning. This approach involves the integration of digital tools (such as cloud technology, artificial intelligence, big data) to optimize learning processes, tailor educational materials to individual student needs, and improve decision-making in educational institutions. In sustainable development, knowledge management aims to create long-term social values to ensure equal access to education, develop digital literacy and critical thinking, promote responsible digital solutions, and support continuous learning and innovation. Integrating digital citizenship courses into the curriculum, including information security, online communication ethics, and combating disinformation, helps to develop skills in the responsible use of digital resources, further advancing sustainable development. However, the practical implementation of these frameworks requires careful consideration of contextual factors across diverse educational systems. Institutional readiness, educator training, and infrastructure disparities pose significant challenges, especially in less digitized environments. Many schools still need comprehensive digital transformation strategies; teachers require ongoing support to build digital fluency and instructional design skills; and infrastructure barriers – ranging from basic connectivity issues to hardware shortages – can hinder adoption. Adaptive approaches, such as blended learning models, tiered implementation based on existing resources, and the establishment of community-based digital resource centers, can help ensure that the benefits of digital citizenship and knowledge management reach all educational communities. Accordingly, the synergy between digital citizenship and knowledge management in the digitalization of education establishes a new culture of interaction with information, raises awareness and accountability among educational stakeholders, and drives innovations essential for social sustainable development.

2. Literature Review

The idea of knowledge management has evolved gradually, integrating economic, managerial and information approaches. One of the first scholars to emphasize knowledge as a key economic resource was P. Drucker (1993), who introduced the concept of the “knowledge worker” and emphasized the significance of managing intellectual assets. In the early 2000s, I. Nonaka, R. Toyama and N. Konno (Nonaka & Toyama, 2003), (Nonaka et al., 2000) introduced the SECI model of knowledge management, which explains the process of knowledge creation and dissemination within an organization. The SECI model (Socialization, Externalization, Combination, Internalization) consists of four stages of knowledge transformation: socialization – the transfer of tacit knowledge through shared experience; externalization – the conversion of tacit knowledge into explicit knowledge via the articulation and manifestation of ideas; combination – the combination of different forms of explicit knowledge to generate new knowledge; and internalization – the assimilation of explicit knowledge which becomes part of an individual’s tacit knowledge.

These foundational works have laid the theoretical groundwork for further research into various practical applications of knowledge management, including its implementation in educational settings.

M. Butnariu and I. Milosan explore knowledge management practices in universities, emphasizing the role of effective knowledge management in enhancing the competitiveness and innovation of educational institutions. They discuss the necessity of implementing knowledge management strategies, which include knowledge creation, storage, dissemination, and application, to improve the quality of education and research. Furthermore, they stress the importance of developing a culture of knowledge sharing among faculty members and students and advocate for the integration of modern information technologies to support knowledge management processes (Butnariu & Milosan, 2012).

Other scholars examine the implementation of knowledge management strategies to enhance the efficiency of university administration and bolster the competitiveness of research institutions. It is emphasized that knowledge management contributes to optimizing educational processes, improves research quality, and stimulates innovation (Stoliarchuk *et al.*, 2023). It is also highlighted that the adoption of knowledge management systems in universities enables more effective resource utilization and increases the overall institutional productivity. The significance of incorporating virtual learning communities into knowledge management systems at universities is explored by A. Strunga, who asserts participation in virtual learning communities ensures continuous access to information for students, fosters high academic performance, stimulates creativity, and facilitates the development of professional identity. Strunga emphasizes the importance of integrating virtual learning communities into university knowledge management frameworks to enhance the educational process and support students' professional identity formation (Strunga, 2015).

The role of communities of practice as a mechanism for managing and preserving knowledge in universities is analyzed by De-Graft Johnson Deia and Thomas Binglevan der Waltb. These communities are regarded as a strategic tool for achieving competitive advantages within universities, as they facilitate the exchange of both explicit and tacit knowledge among faculty members, students, and administrative staff (Deia D.-G & Binglevan der Waltb, 2020).

Within the framework of knowledge management culture, several studies emphasize that research regarding innovation and knowledge in scholarly literature plays a crucial role in fostering a knowledge management culture within higher education institutions (Horban *et al.*, 2021). Effective knowledge management in the educational environment contributes to a deeper appreciation of human capital value. On the cognitive level, the culture of knowledge management facilitates the mobilization of intellectual potential, fosters a shift in thinking styles, and encourages creative engagement. On the managerial level, it involves the integration of analytics and innovative leadership. On the technological level, it entails the active adoption of cutting-edge information technologies (Lomachinska & Lomachinskiy, 2022).

A distinct area of research focuses on the concept of digital citizenship. To examine the essence of digital citizenship, scholars such as G. Öztürk (2021) have conducted extensive research. A. Harris and A. Johns emphasize the security-related

dimensions of digital citizenship (Harris & Johns, 2020). Additionally, L. Pangrazio and J. Sefton-Green analyze digital citizenship in relation to digital rights and digital literacy (Pangrazio & Sefton-Green, 2021).

In summary, amid the rapid advancement of the digital era, further research is needed to explore the intersection of digital citizenship and knowledge management. Investigating this relationship opens new avenues for sustainable development, offering opportunities to refine educational strategies and strengthen institutional knowledge management frameworks.

3. Methodology

This problem is interdisciplinary, which required the use of appropriate methodology: a systematic approach enabled the examination of digital citizenship and knowledge management as interconnected components within the educational system; comparative analysis facilitated the evaluation of different models of digital citizenship and knowledge management; content analysis was employed to identify prevailing trends, dominant discourses, and emerging prospects for digital participation in the educational sphere; the axiological method allowed for an assessment of the core values underlying digital citizenship (democracy, freedom of speech, privacy, and ethical data use) as essential factors for sustainable development; the dialectical method was applied to explore contradictions in the evolution of digital citizenship, particularly the tension between open access to knowledge and the digital divide in the context of sustainable development. Among the empirical research methods, a survey was conducted between February and March 2025. The study involved 180 students from the first to the fifth year across several Ukrainian universities. These included 80 students from Borys Grinchenko Kyiv Metropolitan University, 30 from the State University of Trade and Economics, 30 from Ukrainian American Concordia University, and 40 from Admiral Makarov National University of Shipbuilding. This multi-institutional approach ensured diversity across academic environments, including traditional humanities programs, business-oriented curricula, international education models, and technical disciplines. The sample encompassed young people from all regions of Ukraine, with an average respondent age of 20 years, providing a more comprehensive representation of student perspectives on digital citizenship and knowledge management practices. Participants were fully informed about the study's objectives, guaranteed anonymity for their responses, and provided voluntary consent to take part. The diagnostic phase utilized a structured questionnaire, distributed through Google Forms (with custom-designed content). Data analysis was conducted using both quantitative and qualitative methods. The collected diagnostic information was subsequently interpreted and synthesized during the final stage of the study.

4. Results and Discussion

Knowledge management should be understood as the integration of innovation and communication management, as well as modern information technologies, aimed at

collecting, processing, using and transferring information. This, in turn, contributes to the creation of new knowledge within the organization and its effective application to ensure competitive advantages. Japanese researchers have developed a framework for understanding knowledge development that consists of three key elements. First, knowledge evolves through the dynamic interplay between what is expressible and what is intuitive. Second, this evolution requires appropriate surroundings. Third, the framework accounts for necessary inputs, resulting products, and supporting mechanisms that enhance knowledge development (Nonaka, Toyama, & Konno, 2000). Within this framework, articulated or expressible knowledge encompasses documented theories, procedural methodologies, computational approaches, practical applications, mechanical systems, and technological frameworks. In contrast, intuitive knowledge represents the cognitive paradigms, practiced capabilities, developed competencies, and instinctive insights professionals acquire through years of practical engagement, professional development, and educational pursuits. The continuous, self-reinforcing nature of knowledge development emerges through these interconnected elements. Successfully navigating this complex process requires embracing contradictory perspectives – what the researchers identify as dialectical reasoning.

The knowledge management model, focused on maximizing the use of intellectual resources, finds practical implementation in the educational environment, as the university's intellectual capital is represented primarily by human capital (educational and knowledge potential, professional qualifications of staff) and infrastructure capital (corporate culture, management processes, information technology, network communication systems). Accordingly, a “knowledge triangle” model is being formed that combines education, science and innovation, providing an interdisciplinary approach to solving complex problems of our time.

In particular, across Europe's academic landscape, ongoing digital transformations, population shifts, cross-border accessibility initiatives, and additional influences compel universities to adopt adaptable and pragmatic approaches within knowledge management's three fundamental domains: intellectual, administrative, and digital infrastructure frameworks.

At the cognitive level, knowledge management within digital citizenship frameworks requires particular focus on the evolution of higher-order thinking processes. Critical thinking capabilities undergo significant transformation in digital knowledge-sharing environments, where learners must navigate complex information ecosystems characterized by varying reliability, algorithmic curation, and potential echo chambers. This cognitive dimension encompasses epistemological awareness development (how learners understand the nature, origins, and limitations of knowledge) which becomes increasingly crucial as AI-driven educational tools reshape information processing. When students interact with personalized learning systems, they engage in distinctive cognitive patterns of reflection that differ from traditional pedagogical encounters. These systems, while offering adaptive learning pathways, simultaneously challenge epistemological assumptions by obscuring knowledge provenance through algorithmic processing. Consequently, effective knowledge management must cultivate metacognitive capabilities that enable learners to interrogate not only information content but also its algorithmic mediation. This includes developing cognitive frameworks for evaluating AI-generated

recommendations, understanding data interpretation boundaries, recognizing potential biases in personalization systems, and maintaining epistemological skepticism while benefiting from technological affordances. The cognitive layer thus represents the foundation upon which technological and managerial knowledge management strategies must build, as it determines how effectively digital citizens can translate information exposure into meaningful knowledge construction and application.

The study of innovation and knowledge sharing in academic literature is of great importance for the development of a knowledge management culture in the higher education system. The exchange of intellectual resources within scholarly settings ranks among the most critical areas of investigation in knowledge management research. Innovation primarily stems from this collaborative information exchange. Organizations that actively promote the dissemination of knowledge generate possibilities for breakthrough developments (Horban et al., 2021: 174).

Academic institutions' explicit knowledge resides within scholarly works, periodicals, educational materials, instructional documents, standard records, digital repositories, electronic communications, and institutional websites. The circulation of this information occurs through dynamic professional engagement between university personnel during dialogues, experiential sharing, gatherings, academic symposia, and similar collaborative forums, and contributes to the achievement of the key educational goals (Lomachinska & Lomachinskyi, 2021).

The university environment is favorable for the establishment of communities of practice due to several factors. In particular, universities usually have a developed information infrastructure that provides efficient access to knowledge. Furthermore, knowledge sharing is a natural process for all participants in the educational space, and the desire to acquire new knowledge is inherent in students, faculty, and administrative staff. The trust that prevails in the academic environment fosters the open dissemination of information, particularly through publications and other forms of experience sharing (Deia. & Binglevan, 2020).

The goals of communities of practice and the expected outcomes of their activities largely depend on the specific issue or process they target. At the same time, the generally recognized outcomes of such communities include the verification of existing knowledge, the intensification of interaction among participants, the acceleration of information and experience exchange, the promotion of learning, the generation of new knowledge, and the effective integration of new members into the professional or educational community.

Knowledge management contributes to the continuous enhancement and development of professional competencies through the effective distribution and systematization of substantial amounts of accumulated knowledge, achieved through various academic methods. This, in turn, enables further learning. The process of knowledge management is realized both through the transfer of formalized structured knowledge and through informal mechanisms for harmonizing and disseminating knowledge in everyday academic practice, using analytical methods.

However, analytical methods cannot serve as an effective foundation for generating new knowledge unless the information obtained is applied in the decision-making process. Data-driven management is only possible when there are properly

structured processes and a corporate culture that supports strategic decision-making based on validated information resources.

The dynamics of knowledge management in higher education contributes to the development of a culture of experience and knowledge sharing not only within a specific university but also across the broader networked educational space. The introduction of the concept of openness, which includes open knowledge, open education, and open science, facilitates free access to educational materials, research results, and scientific data for all stakeholders, including both professional researchers and amateur community members.

Modern scientific research is increasingly based on the use of large data sets and digital artifacts. The growth of electronic information in the educational space has led to the formation of a new socio-technical phenomenon – Big Data, which refers to substantial volumes of heterogeneous information, the processing of which requires the application of modern methods and technologies for collection, storage, analysis, and management. Therefore, the culture of knowledge management should be based on a creative approach, as creativity implies fundamentally new ways of applying knowledge. Its implementation requires overcoming outdated mental models that define established action algorithms in specific situations. University administrations should encourage the creation of communities of like-minded individuals and organize their meetings and collaboration, which is essential for effective knowledge sharing. The development of a knowledge-sharing culture should be integrated into the value system of universities. A collegial form of governance, based on the principles of persuasion and consensus, rather than a directive approach, can facilitate strategic transformations in higher education.

Experiential education approaches that enhance students' digital literacy foster critical reasoning development, strengthen capabilities in navigating information systems and digital networks, and cultivate competencies for knowledge creation that supports future professional endeavors.

The global health crisis fundamentally altered intellectual capital structures within contemporary higher education frameworks. Particularly, remote instruction effectiveness and virtual learning environment management emerged as critical priorities. This transformation necessitated enhanced institutional governance frameworks and redefined functional roles for educational process participants. Digital transformation uniquely positions uncertainty as a standard operational element, revealing that digitization's primary obstacles are not technical but human-centered: cultural paradigms, workforce resistance, knowledge gaps, insufficient exemplars, limited resource allocation, motivational deficits, and risk perception (Schwertner, 2017: 392). To address these cultural challenges, higher education institutions must adopt structured change management approaches that emphasize communication, inclusivity, and capacity-building. Overcoming resistance to digital transformation requires not only technical training but also value alignment and trust-building among academic staff. This involves engaging educators in co-designing digital practices, offering professional development tailored to diverse pedagogical traditions, and fostering a shared vision that bridges institutional heritage with digital innovation. In culturally conservative contexts, gradual implementation, peer mentorship, and leadership modeling can facilitate acceptance and reduce tensions between traditional and digital educational norms.

The distinct nature of knowledge management in higher education institutions lies in its dual orientation: an internal dimension aimed at ensuring the effective functioning of the educational system and an external dimension focused on providing high-quality professional training. In the face of the challenges posed by the modern globalized world, competence and identity yield to other personal attributes: speed, proactivity, and non-algorithmic thinking; the ability to take risks, plan, and anticipate; as well as the capacity to relinquish outdated knowledge and experience, among others (Stoliarchuk et al., 2023).

Key opportunities for academic knowledge coordination encompass educational globalization, broader institutional collaborations, the implementation of online learning technologies, a stronger connection with industry, and the enhancement of practice-oriented learning. The concept of an “entrepreneurial university” in modern education envisages the transformation of a classical university into an innovation hub that integrates education, research, and business. The primary objective of such a university is to promote the development of entrepreneurial thinking, the commercialization of scientific research, and the involvement of students and faculty in the creation of innovative projects. It is offered to consider the phenomenon of the entrepreneurial university as a new educational framework that serves as a foundation for reforming the European higher education system. Industrial facilities, academic institutions, and intermediary organizations that bridge academia and industry, situated within close geographical range of one another, can achieve optimal knowledge generation, transfer, and implementation in manufacturing processes (van Oostrom et al., 2019). The key aspects of the entrepreneurial university concept include the adoption of innovative educational models, particularly the use of problem-based learning and interactive methods; the establishment of technology transfer centers; and the use of digital technologies, online education, and artificial intelligence.

Knowledge management and digital citizenship play crucial roles in fostering entrepreneurial mindsets and innovations within the “entrepreneurial university” framework. By integrating digital tools and collaborative platforms, universities can create dynamic ecosystems where students engage in entrepreneurial projects, share knowledge, and collaborate with industry partners. Digital citizenship, with its emphasis on responsible online engagement and ethical use of technology, supports students in navigating the complexities of entrepreneurship in the digital age. Furthermore, the convergence of education, business, and research ecosystems enables the development of curriculum designs that not only focus on academic knowledge but also encourage practical, real-world innovation. This holistic approach can stimulate knowledge commercialization efforts by encouraging students to apply their learning in entrepreneurial ventures while promoting collaboration between universities, industries, and government bodies.

To enhance the effectiveness of knowledge acquisition and improve professional competencies, leveraging the capabilities of online educational networks, based on the formation and development of professional identity, is advisable (Strunga, 2015). Participants in such communities gain the opportunity to interact with experts in their fields at the national or regional level, fostering the growth of their intellectual and social capital. A multi-level system of virtual learning communities can be integrated into the knowledge management framework within higher education institutions, facilitating a gradual transition from the entry level to that of a highly qualified specialist. This approach helps to individualize the learning process, support continuous professional development,

and effectively share knowledge among various categories of stakeholders in the educational environment.

When looking for the best strategies for effective knowledge transfer, the concept of a new information space – a coworking space (CWS) – merits attention. Coworking spaces represent a worldwide increase in new collaborative environments (Rese et al., 2020) that become the intersection of digital education and knowledge management, creating a favorable environment for learning, research, and entrepreneurship. They can function as digital knowledge management platforms that allow organizing access to learning resources, scientific data, and collective research. Digital education serves as the foundation for intellectual interaction, using online platforms for distance learning that integrate with physical coworking spaces; cloud technologies and artificial intelligence for personalized management of learning materials and scientific data; and virtual reality technologies for modeling complex educational and research processes.

A variety of digital technologies can be used to form a knowledge management system in universities, ensuring the efficient storage, processing, dissemination, and exchange of knowledge among students, faculty, and administrative staff. For example, learning management systems such as Moodle, Blackboard, and Canvas facilitate the organization of online courses, the storage of educational materials, and interaction with students, while corporate blogs and forums serve as platforms for knowledge sharing, the creation of collective documents, and collaborative learning. The use of cloud services enables data storage and exchange, access to educational materials, and remote collaboration on projects from any location worldwide.

In this context, it is important to emphasize the importance of the interconnection between information ethics and privacy, in particular in ensuring the effective protection of users' confidential data online. This raises critical questions about maintaining the foundational concepts of freedom and self-determination in the virtual environment (Fugazza & Saldanha, 2017).

We must highlight that the defining attribute of modern information-based communities lies in optimizing personal cognitive capabilities toward ongoing development. Yet, inequalities in information resource availability create technological separation, further widening educational disparities. This gap manifests in unequal access to information, education, scientific research, cultural and linguistic diversity, among other areas.

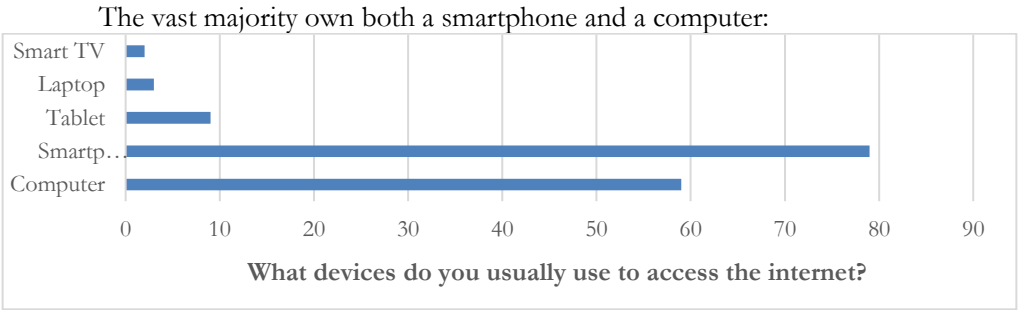
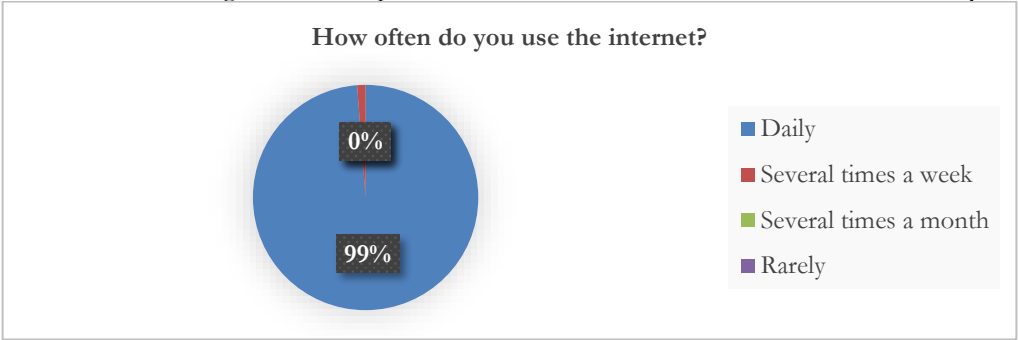
In this context, the issue of the digital divide in education deserves special attention, as it can hinder the achievement of a number of sustainable development goals, including those related to access to quality education, equal opportunities, and economic justice. Lack of access to digital tools and resources can lead to social exclusion of individuals unable to join online communities and share knowledge (Stoliarchuk et al., 2024). Due to the digital divide, students from less affluent or remote regions often do not have access to high-quality digital educational resources, online courses, virtual laboratories, and other tools, which limits their ability to obtain modern education and training, which is an important aspect of sustainable development.

In the educational context, the digital divide can deepen socio-economic gaps, as students from more affluent backgrounds have access to advanced digital technologies and knowledge, while less affluent or remote groups face barriers that limit their development

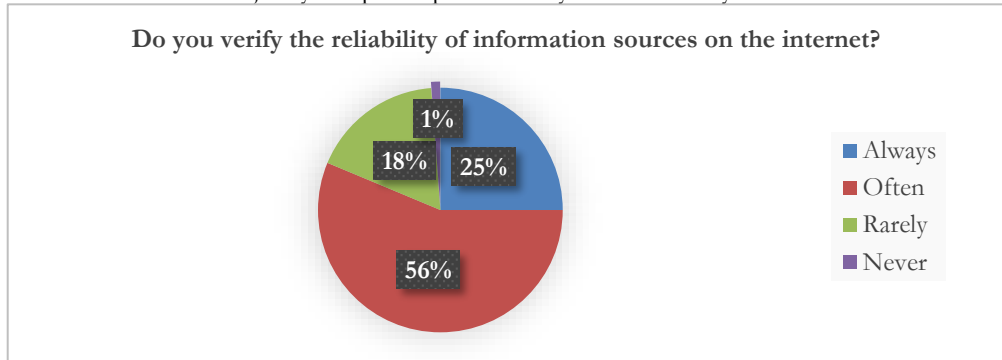
opportunities. As a result, this can increase inequality in access to quality education and opportunities for further effective employment, reducing social mobility. Accordingly, to achieve sustainable development goals, it is necessary to bridge the digital divide in the educational environment by ensuring equal access to technology, improving digital literacy, and creating an inclusive educational environment for all stakeholders.

Digital citizenship can serve as a key tool for bridging the digital divide among participants in higher education, as digitalization facilitates open access to knowledge through online education, open data, and collaborative learning platforms. Digital citizens proficient in utilizing these resources contribute to the advancement of a knowledge-based society. In the context of knowledge management, digital citizenship entails the responsible use of digital technologies, encompassing the development of digital skills, ethical considerations in online interactions, and equitable access to digital resources and tools (Lomachynska & Volynets, 2024).

In global academic discourse, nine elements of digital citizenship are identified and classified into three main categories: digital access, digital etiquette, digital law, digital communication, digital literacy, digital commerce, digital protection, digital security, and digital health (Phillips & Lee, 2019; Öztürk, 2021). The student survey was conducted based on these categories. All respondents have Internet access, and 98.8% use it daily:



The vast majority of participants verify the reliability of information sources:



Among the most common methods of protecting personal data online are strong passwords, two-factor authentication, and restricting access to personal information from unauthorized individuals:

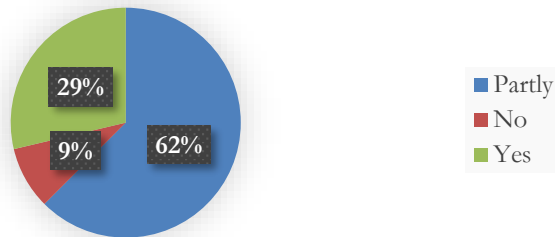


A. Harris and A. Johns define digital citizenship as a concept that extends beyond digital literacy and resilience. They emphasize that it entails not only equipping young people with the skills to navigate their well-being in the digital environment but also fostering the competencies, knowledge, and values necessary for the effective, ethical, and safe use of information and communication technologies (Harris & Johns, 2020).

Accordingly, digital citizenship contributes to the development of essential digital skills among students, educators, and even administrators of educational institutions. This encompasses not only the use of technology for learning (such as engaging with online course platforms) but also the cultivation of critical thinking when evaluating digital sources. It can assist students with limited experience in modern digital technologies in adapting more quickly to new demands and utilizing digital tools for learning safely and effectively.

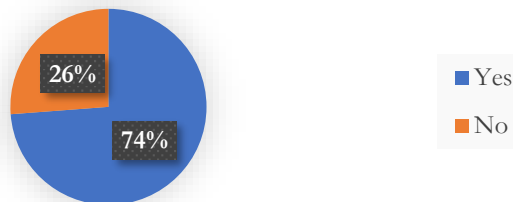
Notably, the study found that fewer than a third of respondents (28.7%) feel confident in cybersecurity matters, while 8.8% acknowledge insufficient competence in cybersecurity:

Do you feel confident about cyber security issues?



Two-thirds of participants use antivirus software and regularly update it:

Do you use antivirus software?



However, 56.3% never back up important data, indicating their insufficient awareness of digital security practices:

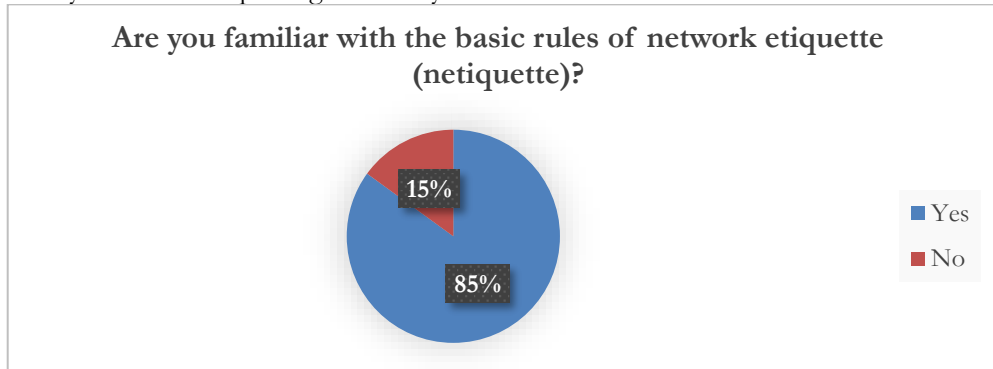
Do you keep backup copies of important data?



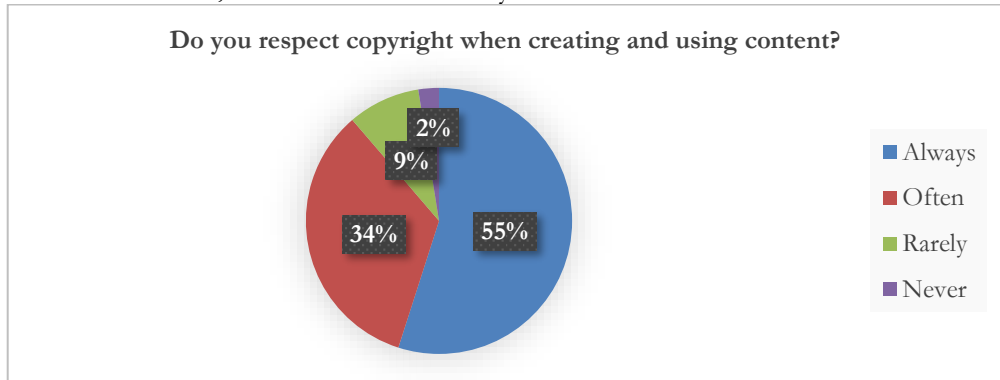
Most researchers define digital citizenship as a set of skills and knowledge essential for effective engagement in social media, where the distinction between content producers and consumers is gradually disappearing. Furthermore, the blurring of boundaries between public and private spaces gives rise to new ethical challenges and opportunities for various age groups, including children, youth, and adults.

In this context, as noted by M. Walters, D. Gee, and S. Mohammed, digital citizenship entails the appropriate, ethical, and responsible use of information and communication technologies across various domains, including interactions with digital devices, web resources, open educational platforms, documents, and collaborative environments, particularly social media (Walters et al., 2019).

The use of social media requires an understanding of netiquette, with 85% of surveyed students reporting familiarity with it:



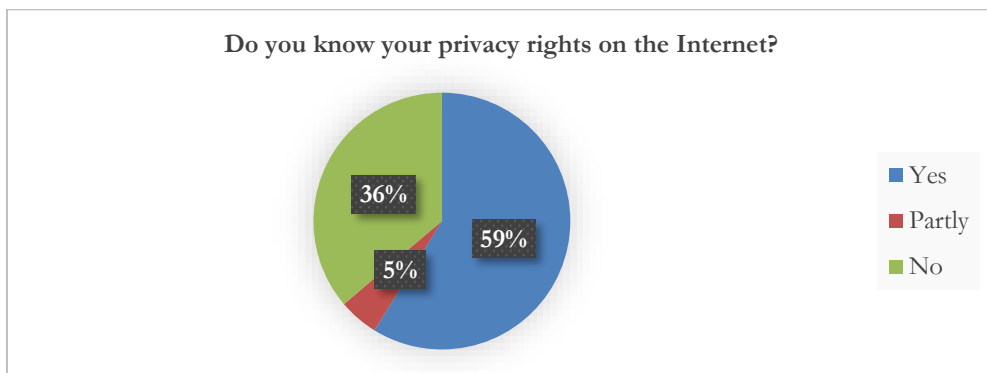
55% of students always adhere to copyright when creating and using content, 38.4% do so often, while 11.3% do so rarely or never:



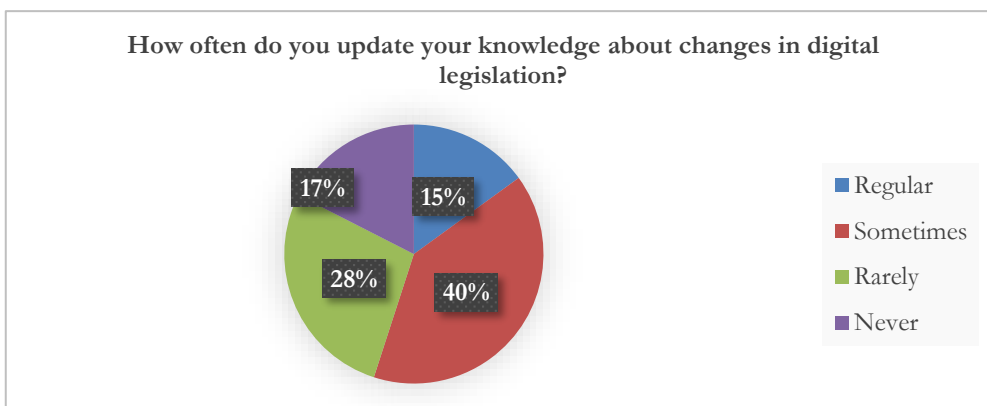
This generally indicates a relatively high level of digital culture among respondents. Indeed, through the responsible and ethical use of social media, students from different parts of the world have the opportunity to collaborate on projects, share experiences, and learn from one another via digital platforms. This broadens learning opportunities, fosters intercultural connections, and contributes to the development of a global digital community.

Digital citizenship also encompasses the development of responsibility and ethical standards in the use of digital resources. In particular, L. Pangrazio and J. Sefton-Green define digital citizenship in relation to digital rights and digital literacy. Digital rights are regarded as an integral component of human rights, ensuring access to, use of, creation of, and distribution of digital content across various devices, including computers and mobile phones, as well as within virtual spaces and digital communities (Pangrazio & Sefton-Green, 2021).

According to the survey, two-thirds of participants are aware of their rights and responsibilities as digital citizens. Specifically, 58.8% of respondents are knowledgeable about their online privacy rights:



At the same time, only 12% of respondents regularly update their knowledge about changes in digital legislation, 40% do so occasionally, 27.5% rarely, and 17.5% never:



Accordingly, universities can integrate elements of digital ethics and digital law into their curricula, teaching students not only the technical aspects but also the safe and ethical use of information, the fight against fake news, and the protection of personal data. This helps students become not only proficient users of technology but also responsible citizens of the digital space.

5. Conclusions

In the modern world, knowledge is a strategic resource for sustainable development. Knowledge management encompasses a range of processes, including knowledge creation (research and study), analysis (identification and organization), implementation (application and demonstration), transmission (transfer and distribution), and optimization (evaluation and improvement). These processes involve the active use of analytical methods to identify the most promising knowledge, classify it, organize information flows, assess its usefulness, and systematize knowledge resources. The main goal of knowledge management in educational discourse is to shape the graduate's

professional and personal identity in line with the demands of the modern professional environment. Knowledge sharing between universities, businesses, and communities contributes to the creation of solutions for a sustainable future.

Digital citizenship represents a framework of skills, competencies, rights, and responsibilities that define a person's effective, ethical, and safe participation in the digital environment. In the context of knowledge management for sustainable development, digital citizenship involves using digital technologies to create, disseminate, preserve, and apply knowledge in ways that support environmental, economic, and social sustainability. Digital citizenship constitutes a pivotal element in the development of a knowledge society, where technology is harnessed for sustainable development and the common good.

Digital citizenship can be an important element in bridging the digital divide in education, as it ensures equal access to resources, supports skill development, and promotes ethical standards. However, for this approach to be effective, educational institutions must actively implement digital learning programs, provide technical support, and ensure equal access to digital tools for all participants in learning environments. This may include providing students with access to online courses, distance learning platforms, library resources, and other digital tools that enhance digital literacy, ensure quality knowledge acquisition, and further develop the intellectual capital of society to achieve sustainable development goals.

To translate this conceptual vision into practice, educational institutions must establish clear metrics for measuring the integration of digital citizenship and its impact on sustainable development. Operationalizing these concepts requires multi-dimensional assessment frameworks that track specific indicators: ethical digital use can be measured through systematic evaluations of online conduct, citation practices, and information verification behaviors; inclusion can be quantified by analyzing digital participation rates across demographic groups, adaptive technology implementation, and accessibility compliance scores; while sustainability impact can be assessed by tracking knowledge application to environmental challenges, community problem-solving initiatives, and collaborative resource conservation projects. Educational institutions can implement digital citizenship portfolios that document student growth across these domains, deploy learning analytics to identify participation patterns and knowledge-sharing behaviors, and establish institutional benchmarks for digital ethics compliance. Regular digital citizenship audits can assess progress in developing critical information literacy, collaborative knowledge construction, and the application of digital competencies to sustainability challenges. By establishing these measurable outcomes, educational institutions create accountability mechanisms that transform abstract digital citizenship principles into tangible contributions to sustainable knowledge ecosystems.

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