A snapshot of digital literacy

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Introduction

Undeniably, worldwide dynamic digital transformation has increased the importance of understanding digital literacies and their practical implementations. So far, academia and library practitioners have not yet reached a consensus in defining digital literacy, although it has been placed in the category of life skills. The term has gained a well-deserved place among other literacies, such as reading, writing civil literacy and environmental literacy and has therefore been included in the set of skills schools should equip students with.

Fluid and expanding, its scope has been the focus of numerous professional and academic organizations. By way of example, UNESCO (2011) considers Digital Skills to be the sum of ICT literacies ("set of user skills that enable active participation in a society where services and cultural offerings are computer-supported and distributed on the internet"), technological (previously computer) literacy ("user and technical computing skills") and information literacy ("ability to locate, identify, retrieve, process and use digital information optimally"). Based on this understanding, UNESCO (2018) created a Global Framework to Measure Digital Literacy (2018) with the following pillars: Information and data literacy, Communication and collaboration, Digital content creation, Safety, Problem solving and Career-related competence. This framework has also been adopted within the European Digital Agenda for the European Digital Competence Framework 2.0 (European Commission, 2016).

The DQ institute (2021) has recently put forward a much more detailed framework, which covers digital literacy, skills and readiness. We are witnessing a broadening of the scope of digital literacy, which exceeds the mere skills referring to technical operations. This framework comprises eight categories of digital literacy. Being digitally literate will have an impact on one's identity, rights, critical thinking skills and emotional intelligence as the digital environment has penetrated the quasi-totality of life aspects. The eight components of the framework are further broken down into specific items: Digital Identity (Digital Citizen Identity, Digital Co-Creator Identity, Digital Changemaker Identity), Digital Rights (Participatory Rights Management, Intellectual Property Rights Management, Privacy Management), Digital Literacy (Data and AI literacy, Content Creation and Computational Literacy, Media and Information Literacy), Digital Communication (Public and Mass Communication, Online Communication and Collaboration, Digital Footprint Management), Digital Emotional Intelligence (Relationship management, Self-Awareness and Management, Digital Empathy), Digital Security (Personal Cyber Security Management, Network Security Management, Organizational Cyber Security Management), Digital Safety (Behavioral Cyber-Risk Management, Content Cyber-Risk Management, Commercial and Community Cyber-Risk Management) and Digital Use (Balanced Use of Technology, Healthy Use of Technology, Civic Use of Technology).

Governmental bodies also design digital literacy frameworks that will be used for policy decisions. The Digital Capability Framework designed by JISC (2018), UK, places ICT proficiency at the core of the model, with four satellite components: information, data and media literacies; digital creation, problem solving and innovation; digital communication, collaboration and participation; digital learning and development, and an overall enveloping category consisting in digital identity and well-being.

For narrower purposes, the National Council for Special Education (2022) in Ireland has built the Digital Literacy Framework around six core skills: access, manage, integrate, collaborate, create and communicate. Canada's Centre for Digital and Media Literacy (2022) looks at digital literacy from the perspective of ICT innovation, i.e. rights and responsibilities, social awareness and identity, pooling knowledge, judgement, problem-solving, reflection, synthesizing, safety and security, navigation skills, accessing skills and opportunity; it also focuses on constructive social action: create, understand, use, access; distribution, infrastructure, tools; as well as on critical/creative thinking: cultural empowerment, citizenship, research/information fluency, distributed cognition, appropriation, creativity, networking, simulation, decision-making, multi-tasking, input/output skills, tools and text skills and competence. The emerging components of these frameworks go beyond technical knowledge or use of ICT, and partially translate digital literacy into a self-actualization tool (identity, awareness, critical thinking, participation, empowerment) and civic tool (rights, responsibilities, citizenship, safety) with an impact on well-being.

The academic environment is coupled to and equally interested in clarifying or further explaining the scope of digital literacy because of its tight connection to markets and industries. Australia's Edith Cowan University (2022) has designed a Digital Literacy Framework comprising five items: digital technologies; information, academic, media and data literacy; digital citizenship and identity; digital creation and communication; and digital learning (professional and lifelong learning). The University of British Columbia (2020) conceived its proper Digital Literacy Framework covering: Research and information literacy, Critical thinking, problem solving and decision making, Creativity and innovation, Digital citizenship, Communication and collaboration, Technology operations and concepts. Last but not least, MacQuaire University (2019) in Sydney proposed a Digital Dexterity model,

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including the six items: Digital Identity and Well-being; Information literacy, media literacy and data literacy; Digital learning and development; ICT proficiency and productivity; Digital creation, problem solving and innovation; and Collaboration, communication and participation. In academia, too, digital literacy becomes an identity and citizenship pillar, seen as a factor of well-being improvement both for individuals and the society.

Global citizenship through digital literacy

In a world surrounded and obsessed with transformative technologies, there is a need for global citizens irrespective of their age to possess a set of digital skills including critical thinking to learn, work, live and contribute to our contemporary society. The COVID-19 pandemic has compelled citizens of all countries, gender, ages and cultures to learn digital literacy practices to be informed, connect and communicate with friends and family living or stuck in remote places. The concept of digital citizenship has gained popularity during the pandemic, and educators must be at the forefront to contribute in aiding and cultivating digital citizenship among students to participate ethically to create a more equitable digital world (Buchholz *et al*., 2020).

Delacruz (2019) argued that the concept of global citizenship should be taught and imparted at an early age so that students understand the importance of their connectedness in our world. Technology accessed by students helps them to connect with any nook and corner of the world and feel like being a global citizen in the age of the internet, 2D, 3D and now Metaverse. Global citizenship is not new and does not require a radical shift in education. Participation as global citizens is not as democratic as it looks. The suppression of information by the governments of various countries has been a barrier to bridging the gaps of information between individuals and nations.

Digital literacy education

We can categorize global citizens into two major groups: digital natives and digital immigrants. According to Prensky (2001), the generation born after 1980 is considered as digital natives who have grown up with surrounding technologies as a natural part of their daily lives. According to Prensky, digital natives have a connection culture that is different from that of the previous generations, growing up in digital technology, creating and sharing online content. Because of the importance of having digital literacy knowledge, skills and abilities for the future of the people (as well as their countries and the world), digital literacy acquisition processes cannot be left alone or to the chance. Moreover, as digital usage increases, the digital natives become more sophisticated users. Therefore, teaching multidimensional digital literacies should start as early as possible in children's digital world. Leaving it to higher education will be very late to prepare learners for their professional lives afterwards (Duggan, 2013). Karaboga (2019) claims that digital literacy education should start from a child's family, which requires parents' awareness and proper practices to be a role model for the child. Public libraries have a role in outreach to older citizens to help in developing vital digital skills for up-to-date authoritative information.

Having a multidimensional nature and being directly affected by rapidly advancing technologies, digital literacy learning will continue endlessly and many people (other than parents) could play the educator roles, such as peers, teachers, professors, classmates, librarians and colleagues. For example, Duran and Ozen (2018) argued that it has been the duty of primary school and language teachers to enable students to approach and make sense of digital literacy with a critical and questioning perspective. As Knobel and Lankshear (2006) pointed, digital literacy must be defined as an official and overt goal of education on any level. Briefly, digital literacy should be a building stone of lifelong education for anyone.

Moreover, digital natives increase their digital literacy levels by their direct technology interaction. For instance, students' social media usage resulted in positive correlation with their digital literacy level (Seckin-Kapucu *et al*., 2021). In a changing world, students realize and use the instructional aspects of websites and social media, especially YouTube, to a larger extent. Similarly, adults have reshaped their ways of performing their jobs and shifted towards distance/online working environments where they need to immediately learn digital literacy skills, such as managing their meetings on Zoom or Microsoft Teams while dealing with many other digital operations in the background. Not only students but also employees have found themselves in a position that their digital literacy should increase exponentially (not gradually as earlier before) to overcome the new challenges of their professional and personal lives. That is the moment where many people have considered the internet resources (dominantly social media, and especially YouTube) as their panacea. As a result, the internet resources have become an alternative digital literacy enhancement mechanism. Therefore, the practical roles of the internet should not be ignored in the digital literacy development actions.

Critical thinking skills in digital literacy in information literacy education

Critical thinking is an important skill of a human for making informed judgements about gathered information, with caution about the legitimacy and comprehensiveness of the digital sources. Bawden (2008) referred to critical thinking as "most essential", "most significant" and "overarching" competency for retrieving information from internet sources. Often, we confuse critical literacy with critical thinking; the former is the capability to assess the benefits of new technologies. Critical thinking skills in digital literacy include critical evaluation of digital sources, visual content, the credibility of content, the reasoning behind the content and following ethics and cyber etiquettes on the digital platforms.

When it comes to digital literacy among students, there is a need to develop a culture of critical thinking to engage critically with the content they search on the internet, connecting it to the subject knowledge they have learned or seeking to advance. Eshet-Alkalai and Chajut (2009) found that critical thinking in digital literacy among the younger population decreased, but it improved for adults over time. This implies that younger generations do not put effort into sorting the reliable content from digital sources whereas adults do know the importance of critical thinking

while retrieving information. Therefore, polishing the critical thinking skills among the younger learners is important at an early age as it involves them in learning activities that build creativity and critical thinking. As Freire and Macedo (2005) argued, critical thinking is not just a set of skills but an attitude to information, a way of living and thinking, which should be aimed for achievement and social change. Libraries play a major role in this area in teaching students how to determine if information is authoritative, unbiased, recent and authentic.

As the access to information globally has touched new pinnacles, governments in a few authoritative countries finely sharpen strategies to limit, suppress and govern its use (Howard *et al*., 2011). Democratic participation in the digital world is limited and even eroded by sweeping suppression and surveillance measures (Stoycheff *et al*., 2020). Political and governing parties around the world have realized the potential of digital space for citizens to join and propagate social, economic, political and environmental issues. Internet-based activism and civil society robustness have been seen as a force to bring large groups together in online spaces, which otherwise could have been impossible offline.

To counter the online content about protests, gatherings and other arrangements of mobilization that may disturb political mandates, sophisticated censorship strategies are applied by the governing bodies. The absence of this censorship does not mean that there will be an open democratic online society where citizens will retrieve and post any information. Apart from the censorship, constant online surveillance helps dictators witness patterns of behaviour among citizens. Online surveillance can be the first step to censor content for citizens, and countries like Egypt, Russia, Brazil, India, the USA, the UK and Ukraine continuously monitor even after content restrictions (Stoycheff *et al*., 2020).

To effectively propagate digital citizenship, freedom to retrieve information and openness to post information, the suppression of information should be minimal. Countries have to realize the importance of democratization in the online space and let the information float freely for anyone and anywhere. Surveillance and censorship will erode the essence of the internet and digital media and will make it less useful, effective and valuable. Citizens of the digital world must be skilled to differentiate between right and wrong, fake and real and truth and falsehood to mitigate the repercussions of information suppression.

Given the growing importance and scope of digital literacy, education nowadays cannot be seen decoupled from it. On the contrary, the other types of literacies go hand in hand and somehow overlap with digital literacy. According to UNESCO (2011), digital literacy has many overlapings with other types of literacies or skills, such as ICT literacy, civic literacy, cultural literacy, and lifelong learning skill. The lack of consensus is a proof of the fuzzy boundaries of and interdependence between such literacies.

Concluding remarks

The unprecedented development rate of digital technologies has promoted many implications to our digital lives. Among those advancements, artificial intelligence (AI) has influenced the others most. Along with smart applications, AI has been implemented into many smart tools, such as robotics and drones. That evolutionary changes have clearly affected our digital literacy set of knowledge, skills and abilities, which must include "[. . .] better data analysis and forecasting, the development and the launch of advanced educational products which uses artificial intelligence techniques [. . .]" (p. 55, Kateryna *et al*., 2020).

As Ocaña *et al*. (2019) asserted, the inclusion and use of AI in the current digital literacy frameworks are not a luxury anymore but a crucial requisite. Otherwise, starting with university graduates, the public may not be able to fulfil the demand from different industries. Based on this prediction, UNESCO posits that all levels of schools need a new curriculum for a digital and AI-powered world, which will provide a "[. . .] shift from basic digital literacy to higher order (computational) thinking skills" (Francesc, *et al*., 2019, p. 22). Thus, new digital literacy frameworks must embrace AI competencies to maintain the sustainability of any industrial endeavours at this digital age.

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