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An Integrated Comparative Study of Digital Citizenship Frameworks

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Abstract

An assessment of both contemporary policy texts and academic literature demonstrates that digital citizenship is a complicated and somewhat fragmented topic with multiple perspectives co-existing. The research paper compares, analyses and summarises the competencies covered by existing frameworks for digital citizenship. The research paper also aims to identify the gaps exhibited in existing framework. Additionally, the absence of global agreement and standards complicates matters for governments and other organization, particularly in underdeveloped nations, to plan and implement comparative and cost-effective projects .The paper examines various frameworks that seem to be particularly well suited to the study of Digital Citizenship. These competency frameworks, should not be used as self-sustaining tools but as part of a holistic approach that act as a yardstick, permitting them to be customised to the socio-cultural setting in which they are used. In this context, the study makes certain recommendations.

Keywords: Digital Citizenship, Citizenship, Digital Technology, ICT

Introduction

Digital citizenship encompasses the ability to use ICT safely. It is about teaching children to be true digital citizens that are equipped with both the technical and socioemotional skills which are necessary to engage critically and ethically with digital tools. Education 2030 Framework for Action emphasises the critical nature of digital skills that citizens should learn in order to live confidently in a globalised, knowledge-based and technology-driven world. Digital technologies enable individuals to express themselves as consumers and creators of digital content. The application of technology help with problem solving, creativity, and self-expression. Additionally, participation in the digital world fosters a sense of responsibility, which enables individuals, especially children and adolescents, to impact society. While digital technologies have created several opportunities and perks, they have also caused a number of ethical and social concerns such as online frauds, online sex trafficking, data theft, cyberbullying, radicalization, violent content, hate speech and deceptive propaganda.

According to UNESCO (2016) digital citizenship is ***"being able to find, access, use and create information effectively; engage with other users and with content in an active, critical, sensitive and ethical manner; and navigate the online and ICT environment safely and responsibly, being aware of one's own rights."***

Numerous international organisations have developed frameworks for digital literacy competences such as the European Commission DigComp framework, the Council of Europe's Digital Citizenship Education framework, the UNESCO Media and Information Literacy (MIL) framework, the OECD Skills Research framework and the Digital Intelligence framework. Others such as the Learning Wales initiative, the UK Jisc Digital Capability Model or the British Columbia Digital Literacy Curriculum, were developed for use at the national or subnational level. Also, the International Computer Driving Licence (ICDL) and Microsoft's Digital Literacy Standard Curriculum are administered by private sector entities. Finally, several non- governmental organisations and foundations have created well-known frameworks for developing digital literacy competencies, such as the Common Sense Education K-12 Digital Citizenship Curriculum or the Mozilla Web Literacy Framework.

Methodology

This study uses secondary data, relying on information that has already been published rather than data collected

directly from participants. Reviewing existing material made it possible to explore the topic from different viewpoints and understand how ideas in the field have developed over time. A range of sources were consulted, including books, journal articles, research papers, and trustworthy websites.

The similarities and connections identified in the research came from carefully comparing these sources and noting where their findings or arguments aligned. Because the materials represented different authors and contexts, they offered a broad and balanced understanding of the subject. Using secondary data also made it possible to link established theories with more recent evidence, creating a clearer picture of current developments. Overall, this approach ensured that the study was grounded in reliable information and supported by a wide variety of perspectives..

Review of frameworks

The Australian Curriculum Assessment and Reporting Authority developed a three-dimensional digital technology curriculum. It is divided into two sections: design and technology and digital technology. It focuses on eight areas of learning, one of which is technology. Technology (F–10) is divided into two distinct strands: knowledge and comprehension of digital technologies and processes and production skills in digital technologies. As the world transitions to a digital economy in which education, health and all other elements of life are digitised, it is critical for learners to understand how to exercise and build digital technology so as to fully engage in the digital world. The curriculum for digital technologies is organised around core principles that are relevant both in the future and in the present. The curriculum's defining feature is that it is thought-based. Computational thinking is a technique for problem solving. It is a method for dissecting an issue, determining what is significant in the problem, abstracting some of the critical aspects and then designing a solution capable of really solving the problem. The digital technology curriculum fosters the development of transferrable knowledge and skills that students can use lifelong. (Australian Curriculum Assessment and Reporting Authority, n.d.)

Common Sense Education has established a K-12 Digital Citizenship curriculum to educate learners to think critically and engage ethically in the digital environment. It introduces the concept of a digital footprint to children in grades K-2 and includes modules on safety and cyberbullying. The curriculum's upper bands are divided into grades 3-5, 6-8, and 9-12 and has larger emphasis on proactive learning. The pupils are taught about how to use the internet strategically, live a digital life and defend themselves against hazards like identity theft, cybercrimes, cyber bullying. (Common Sense Media Inc., n.d.)

CoE (Council of Europe) considers child's online and offline life as a whole and a critical component of formal education. Physical barriers have been shattered rather than dismantled by the digital revolution.
The internet world is not restricted by any peripherals. Educators must ensure that teaching digital citizenship is integrated in the education system. It highlights three elements of online existence being online, wellbeing and rights online .These concepts hold true for human interactions and behaviour in both the digital and physical worlds. Each citizen is accountable for the same things. Richardson and Milovidov (2019).

DQ Institute /Digital Intelligence quotient is a summation of social, emotional and cognitive abilities that enable an individual to deal with the challenges and demands of digital life. It constitute Citizenship, Creativity, and Entrepreneurship are the three developmental elements. DQ Citizenship, at its most basic level, is the capacity to manage digital use in a responsible and effective manner. DQ Creativity, on the second level, is the capacity to produce something new. DQ Entrepreneurship, at the highest degree, is the ability to use the internet to exert influence and solve issues. The programme is self-paced for children aged 8 to 12 and covers all of the digital competencies imperative for development of knowledgeable and proactive users of technology.DQ world is an online and mobile learning platform to empower children to self-learn their DQ.It comprises of series of missions that needs to be accomplished by the child such as animated videos, comics, chats, interactive game and quizzes. As they complete each mission, children will earn points, level up to earn DQ badges, cards and DQ coins.Upon completion of mission child will receive DQ score, based on eight core digital citizenship skills. (DQ Institute, n.d.)

The European Digital Competence Framework abbreviated as **EU DigComp** provides a mechanism for citizens

to improve their digital competences. The Digital Competence Framework can assist with self evaluation, goal setting, identifying training opportunities, and job search facilitation. DigComp defines the knowledge, skills and attitudes that individuals must use critically, collaboratively, and creatively in all facets of life. It can be used to determine an individual's or a population's level of digital competence, as well as its strengths and weaknesses. Vuorikari, Punie and Carretero (2016)

Global Kids Online is a robust trans-national evidence based research on children's internet use. The project designed a global research toolkit to assist various organisations and stakeholders to conduct research with children and their parents on the benefits and risks associated with children's internet use. There are four sections of the GKO research toolkit: qualitative, quantitative, method recommendations and tool adaptation. Livingstone (2016)

The International Computer and Information Literacy Study study examines how young people acquire computer and information literacy in order to engage in the digital age. The ICILS analyses how students acquire the set of computer and information literacy knowledge, understanding, attitudes, dispositions, and abilities. ICILS collects data on how teachers and students utilise computers in education from students, teachers, and principals perspective. Fraillon, Schulz and Ainley (2013)

International Society for Technology in Education (ISTE, 2016) act as a cornerstone for defining a clear set of benchmarks for the future world of work including skills, knowledge and technology updation. The Standards aspires to help students become enduring learners and provide them with the abilities they will need to face future difficulties effectively. The ISTE standards enable a learner to discover, innovate and explore through the use of technology in learning. It focuses on exploiting talents through technology rather than digital resources or technologies.ISTE has set of standards for teachers, students, coaches and leaders.

The Mozilla Web Literacy Framework curriculum is composed of core activities that align with the Web Literacy map and are intended to provide learners with a fundamental understanding of the web and ethical engagement of the web. The Core Activities are designed to help learners understand the web through the lens of their own needs, interests, and daily lives. The Web Literacy learning experience is highly interactive and collaborative, involving brainstorming, sharing, discussion and reflection. Numerous exercises can be completed offline without access to the internet or with limited computer access in order to make Web Literacy accessible to as many learners as possible.

The Learning Technology Framework lists the primary areas of educational technology. It looks at seven different types of educator attitudes, behaviours, and practises when it comes to employing technology in the classroom. It helps leaders, coaches, peers and individual teachers recognise how technology affects them and their students. Higher education educators capability in the use of learning technology, increased instructional efficacy and improved learning experiences should all arise from such support. (The Learning Technology Framework, 2020)

OECD Skills Research goal is to assess individual's proficiency in three primary domains: literacy, numeracy, and problem-solving skills, as well as whether and how those skills are employed on the job and in everyday life. (OECD, 2016) Problem solving in technologically advanced situations is defined as the ability to receive and assess information, engage with others and complete practical tasks using digital technology, communication tools, and networks. It emphasises on the ability to use information and computer networks to solve problems.

ThinkYoung Digital Resilience is a non-profit organisation who work for young people by involving them at grass root level and offering high-quality research on major topics that impact young people as decision-makers. ThinkYoung conducts research and polls, produces documentaries, draughts policy ideas and creates educational programmes. ThinkYoung, Rimini, Howard and Ghersengorin (2016)

UNESCO ERI-NET Transversal Skills framework aims to address a wide variety of skills and competences that learners will need to manage the rapidly changing global landscape. Some of the transversal skills that are usually referred to as 21st century abilities are innovative thinking, ingenuity, flexibility, humility, global awareness and communication. Care and Luo (2016)

UNESCO Global Citizenship Education intents to provide students with the proficiency, experience, skills, ethics and dispositions that they will need to impart to a more democratic, equitable and peaceful society. It dwells on human right and peace education. It intends to instil competencies and values in the learner so as to be a digital citizen. Global citizenship education begins from childhood and continues through all levels of education. It necessitates both formal and informal approaches. It also integrates curricular and extracurricular interventions. UNESCO (2015)

The **UNESCO Media Information Literacy (MIL)** states that citizens must be able to access, retrieve, comprehend, analyse and use information and media content in all formats, as well as generate and distribute it in a critical, ethical and effective manner. Teachers must become media and information literate in order to improve MIL among their students. (UNESCO, 2013)

The UNICEF Digital Landscape Studies examine how technology impacts teenagers and young people in both developed and developing nations. The document does not propose a foundation for digital citizenship, but it does provide an overview of the legal and digital ecosystems in which it operates.
UNICEF (2014)

21ST Century Children as Digital Citizens entails participation in the digital world can help increase social inclusion. Not everyone, however, will profit equally. Children who lack or have limited access to technology are excluded, which can have a negative impact on their social, civic, and academic lives.
Children can begin learning digital skills in primary school, although the majority of instruction occurs at the secondary level in most systems. To prosper in the digital prudence, well-built digital skills must be complemented by social and emotional skills. OECD (2019)

Comparative Analysis of Frameworks

Name Of Framework	Digital Citizenship Definition	Aim Of the Framework	Dimensions	Mode Of Implementation	Key to Sustain
Australian Curriculum Assessment and Reporting Authority	"Digital citizenship includes appropriate online etiquette, literacy in how digital technologies work and how to use them, an understanding of ethics and related law, knowing how to stay safe online, and advice on related health and safety issues such as predators and the permanence	To enable that all students benefit from an understanding of and exposure to historic, contemporary and emergent technologies that shape our world.	Design technology and digital technology	Curriculum	Disciplinary knowledge, skills, understanding, and general capabilities.

	of data."				
nmon Sense Education	"It is a way of thinking online, being online and acting online. It is thinking critically and not trusting everything an individual sees. It's being safe, acting responsibly in how someone behave and communicate"	To build a digital world where kids can thrive	''Privacy & security, digital footprint & reputation, self-image and identity, creative credit & copyright, relationships & communication, information literacy, cyberbullying & digital drama, and internet safety''	Curriculum (K-12), games such as Digital Passport, digital Compass, rating movies, research, privacy program.	Responsible digital participation
COE Digital Citizen Framework	"A digital citizen is someone who, through the development of a broad range of competences, is able to actively, positively and responsibly engage in both on and offline communities, whether local, national or global. As digital technologies are disruptive in nature and constantly evolving,	It examines ethical concerns and leads users through innovative, collaborative citizenship-oriented concepts and activities intended at assisting educators and empowering young citizens, as well as motivating learners to explore their local on- and offline communities.	Values,Attitides,skills,knowledge and critical understanding	Framework	Model for digital citizenship with inclusion of Stakeholders and implication for policy and practice

	competence building is a lifelong"				
al Kids Asia Pacific	The framework establishes a prerequisite, two principles and five areas that correspond to sixteen competencies, creating a balance between online risk avoidance and growth of digital opportunities	It establishes and evaluates a tool for assessing the defined competencies and relevant factors.	''Digital Literacy, Digital Safety and resilience, digital participation and agency, digital emotional intelligence, digital creativity and innovation''	Framework	The DKAP Framework provides governments, organizations, and civil society with a complete lens to study digital citizenship, as well as well-grounded concepts to assist in the development of educational policies and intervention programmes.
DQ Institute	"The ability to use digital technology and media in safe, responsible, and ethical ways"	To establish a universal norm of digital citizenship for all children around the world.	''Digital citizen identity, screen time management, digital footprint management, cyber bullying management, digital empathy, critical thinking, privacy management, and cyber security management''.	Global standards, Common Assessment, impact measure, Games	Education for digital skills spans eight competencies: identity, use, safety, security, emotional intelligence, literacy, communication and rights. .
EU DigComp	"Digital competence is the set of skills, knowledge and attitudes that enable the confident, creative and critical use of technologies and systems"	The Digital Competence Framework can aid in the monitoring of citizens' digital capabilities and the development of curriculum.	''Information and data literacy, Communication and collaboration, Digital content creation, Safety, Problem solving''	Curriculum for foundation, intermediate, intermediate and highly specialised.	Digital Competencies
Global Kids Online	Reflects the integration of both the effective and safe aspects of ICT use in a comprehensive manner.	Global Kids Online is an international research effort that intends to create a global network of researchers and specialists to build and maintain a rigorous cross-national evidence base on	''Child identity and resources, access, opportunities and practices, digital ecology, skills, risks, unwanted sexual	Tools for Researcher and research	Factors that affect child's online digital space

		children's internet use.	experiences, well-being, family, school, peers and the community, and the parent module''		
International Computer and Information Literacy Study	The objective of ICILS is to explore how young people develop computer and information literacy in multitude of countries in order to support their capacity to function in the digital age.	Students must have knowledge, understanding, attitudes, dispositions, and abilities that comprise computer and information literacy in order to engage effectively in the digital age.	''Information literacy and media literacy''	Framework and Assessment design	Investigate range of countries, the ways in which young people are developing computer and information literacy (CIL) to support their capacity to function in the digital age.
International Society for Technology in Education	"Digital citizenship goes beyond conversations about personal responsibility. It's about being active citizens who see possibilities instead of problems, and opportunities instead of risks as they curate a positive and effective digital footprint"	To develop lifelong learners.	''Empowered Learner, Digital Citizen, Knowledge Constructor, Innovative Designer, Computational Thinker, Creative Communicator, and Global Collaborator''	Curriculum	Pupils to become lifelong learners and to provide them with the tools they will need to respond effectively for future challenges.

Mozilla Web Literacy Framework	"Web literacy is defined as the ability to read, write and participate on the web. Web literacy touches on a variety of competencies– from composing and coding to understanding why privacy matters online– but it allows students to do one essential thing: meaningfully engage on the Internet"	To identify core Web Literacy Skills and 21st Century Skills	''Problem solving,communication,creat i vity,collaboration''		Curriculum	Web literacy
OCED Skills Research	"Digital citizenship empowers children to actively and responsibly take part in society"	To determine what knowledge, competencies, attitudes and values today's students require to succeed, as well as how instructional systems should be established to efficiently and effectively implement them.	''Literacy, numeracy, and problem-solving skills''		Research	Adding fresh value , resolving conflicts and dilemmas and taking ownership
The Learning Technolog y Framewor k	Positive code and conduct during online interactions.	It investigates seven different types of educators' attitudes, actions, and practices when it comes to using technology in the classroom. It helps leaders, coaches,	''Respectful,Responsible, effe ctive,reputation''	A guide for analysis and support of educators' skills and capacity with learning technology.	Learning,leading,operating,coll abor ating,citizenship,designing and teaching	

		peers, and individual teachers recognize how technology affects them and their students.			
ThinkYoung Digital Resilience	"How to best keep children safe when online but also free to access and use the internet in a way for both individual empowerment and for actively seeking and benefiting opportunities"	The ThinkYoung Digital Resilience study is a global study that looks at how youth aged 9 to 18 can avoid and respond to online risk.	''Awareess,cognitive strategies, instrumental actions, communicative strategies''	Research and workshop	Preventive competencies and reactive competencies
UNESCO ERI- NET Transversal Skills	"Responsibility and Ethical Understanding"	Awareness, tolerance, openness, responsibility, respecting differences, ethical understanding, intercultural understanding, ability to negotiate problems, democratic engagement, conflict resolution, environmental respect, national identity and a sense of belonging.	''Critical and innovative thinking ,inter-personal skills intra-personal skills and global citizenship''	Education policy and curriculum framework	Essential skills and competencies to facilitate the acquisition of transversal skills.

UNESCO Global Citizenship Education	"Global citizenship refers to a sense of belonging to a broader community and common humanity. It emphasizes political, economic, social and cultural interdependency and interconnectedness between the local, the national and the global"	Seeks to provide a global citizenship education framework that may be easily adapted to varied national and local situations.	''Cognitive Socio-emotional Behavioural''	Framework	Pedagogical guidance on global citizenship education
UNESCO Media Information Literacy	"MIL is defined as a set of competencies that empowers citizens to access, retrieve, understand, evaluate and use, create, as well as share information and media content in all formats, using various tools, in a critical, ethical and effective way, in order to participate and engage in personal, professional and societal activities"	It focuses on determining the availability of MIL-promoting institutions. In other words, assessing policy and institutional readiness. The goal of this project is to promote MIL among students, teachers, and teacher educators.	''Information Literacy and media literacy''	Framework	Equip citizens with 21st century skills

UNICEF Digital Landscape Studies	"Digital literacy implies a set of competences that goes beyond digital and technical skills. It includes the ability to search, evaluate and manage information found online; interact, share and collaborate online; develop and create content; use safety and protection features, and solve problems and be creative"	To analyse the impact of technology on adolescents and youngsters	A comprehensive desk review and in-country data collection	Research	Insight of legal and digital environments in which it functions
21st Century Children As Digital Citizens	"Digital citizenship can be understood as norms of behaviour regarding the use of digital technologies''	To ensure effective engagement with digital technology	"Enabling access to digital technologies, building digital, social and emotional skills, developing digital citizenship''	Framework	Child well-being and pro-social development.

Discussion

In digital citizenship, we are moving away from an instrumental view, which is, "What should a digitally literate individual be able to do?" and towards a more holistic one, which is, "What does it mean to be digitally literate today?" There is no universally accepted definition of digital citizenship. Educators should be encouraged to use technology to provide their students with transformative learning experiences. Digital citizenship shouldn't be taught in isolation but integrating into different subjects. Digital Citizenship should be integrated in the curriculum during foundational years of the education. Students should be given ample opportunities to express their competencies of the digital world. Teachers should be able to deliver lessons on digital citizenship in a constructive manner. Many international organisations are emphasising the importance of providing citizens with digital skills in order to improve economic and societal outcomes in order to develop certain standard approaches with emphasis on citizens of all ages. UNESCO's Digital Kids Asia-Pacific framework (2019),the Digital Competence Framework for Citizens (DigComp) developed by the European Commission (2018),the DQ Institute Digital Intelligence framework (2019) and the Digital Citizenship Education Framework (2019) have the greatest scope for modification and is also relevant to the learners needs. In addition, there are plenty of national and international projects aimed at improving kid's digital literacy including prolonged commercial programmes. While some are based on the frameworks indicated above, the bulk, particularly in developing countries, are based on frameworks produced by commercial groups. There are numerous UNICEF projects promoting digital literacy, but it appears that few of them focus on system strengthening and only a handful have been reviewed. The framework for digital citizenship competence should be technology-agnostic. This means that competences should not be limited to technologies and platforms. DigComp is a commonly used framework

that can be utilised when a full explanation of the various degrees of ICT competency proficiency is needed. The Digital Kids Asia-Pacific competence framework, on the other hand, might be employed in situations where a citizenship perspective is preferred. For children above 12, curriculum of Media and Information Literacy should be integrated into different subject for building competencies pertaining to digital citizenship. The digital citizenship competency framework must be adaptable enough to be used in a range of scenarios. This means that the framework would have to take into account cultural and linguistic differences in order to allow for socially appropriate technology use. Also, common sense education and ISTE standards have created most structured frameworks on Digital Citizenship.

Suggestions

The framework should consider parents, schools, ICT system and the environment in which the child nurtures. Digital Citizenship shouldn't be taught in isolation but through multidisciplinary context. Digital ergonomics should also form a major component of digital citizenship. Such a framework should be designed that reflects how youngsters travel between online and offline environments. Moreover, the paper covers a couple of frameworks, but there a bunch of more that exist. The need of the hour is not building a new framework but to dwell upon the existing frameworks, a more comprehensive definition of digital literacy should be acknowledged. A standardised scale to measure digital citizenship should be advocated. Digital Citizenship should be developed as a concept that goes beyond digital skills and digital literacy. Students should be provided opportunities to develop digital citizenship behaviour to protect themselves. They should be aware about of digital ethics, digital ergonomics, digital laws and responsibilities Curriculum, should be implemented in a way that it nurtures students to be digitally resilient. Students should be taught about various digital competences.Parents should get involved in internet and digital citizenship debate. They should be counselled about digital parenting.Curriculum should be enriched with various dimensions of digital citizenship. Digital citizenship should not be limited to ICT curriculum only, it should be cross disciplinary. Real life experiences should be provided for participating and engaging online. Children's engagement in the digital world should be built on a thorough and evidence-based understanding of educational programmes and policies that support digital competencies. They should also include the interventions that are most important in developing these skills.

Conclusion

Building digital skills from the early years is essential, as this is the stage when children first begin to interact with technology in their daily lives. Early guidance helps them learn how to use digital tools safely, confidently, and in ways that support their learning and curiosity. When children gain these foundations, they are better equipped to handle the responsibilities and challenges that come with growing digital access in later schooling and adulthood. For this to happen fairly, education systems need to adopt approaches that are broad, thoughtful, and sensitive to the different circumstances children grow up in. Many learners, especially those from disadvantaged backgrounds, face obstacles such as limited devices or unreliable internet. Any programme aimed at strengthening early digital skills must therefore place equity at its core. Ensuring that all children regardless of family income, location, or home environment have opportunities to learn and practise digital skills is critical. Reducing these gaps not only supports safe and meaningful digital use today but also lays the groundwork for equal participation in the digital world throughout their lives.

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