

Digital Literacy In The 5th Industrial Revolution: Importance And Relevance To Secondary Education Goal Attainment

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Abstract

This study investigated digital literacy in the 5th industrial revolution: importance and relevance to secondary education goal attainment. It focused on the importance of digital literacy in the 5th industrial revolution and its relevance to the attainment of the secondary education goal. Digital literacy refers to the ability to understand and use digital technologies effectively and responsibly. It encompasses a range of skills, including finding, evaluating, and communicating information using digital tools like computers, smartphones, and the internet. Essentially, it's the ability to navigate and thrive in a digital world. Being able to navigate information and ideas through the use of technological tools and equipment is what digital literacy entails. The 5th industrial revolution refers to the surge in advanced technology, which involves the use of humans, machines, and AI to solve world issues. It can be applied to any sector, including the educational sector. Digital literacy in education implies the ability to use and apply digital technologies in education. It involves the application of technological tools in education, in order to achieve set goals. Secondary schools have goals to be achieved. These goals are essential in order to make schools meet their targets as well as accomplish their vision and mission. Digital literacy enables access to educational resources, promotes independent learning, and improves academic performance through digital tools. The importance of digital literacy in the 5th industrial revolution, as it relates to secondary education goal attainment, is that it helps reduce workload for staff, ensures there is a secure and accurate database of all students, facilitates the teaching and learning process through the application of ICT in school, amongst others. It also equips students with essential skills for the digital age, including communication, critical thinking, and online safety. This digital knowledge helps in the attainment of secondary education goals and the success of secondary schools.

Keywords: Digital Literacy, 5TH Industrial Revolution, Secondary Education, Goal Attainment

Introduction

Digital literacy becomes crucial for individuals and organizations to navigate and thrive in the evolving digital landscape. It's not just about technical skills, but also about critical thinking, understanding the ethical and social impacts of technology, and being able to adapt to rapid change. In the Fifth Industrial Revolution (5IR), characterized by the integration of digital

technologies and AI, it is important for individuals to develop and excel in the new digital world. Digital literacy in the 5IR requires not only the ability to use digital tools but also a deep understanding of the underlying technologies, their applications, and their potential impacts. Digital literacy is the ability to effectively and confidently use a range of digital technologies for information, communication, and problem-solving. It encompasses skills like searching, evaluating, sharing, and creating information online, as well as understanding the impact of these technologies. In essence, it's about being able to navigate and utilize digital platforms safely and appropriately.

Concept of Digital Literacy

Digital literacy is closely related to literacy. While literacy refers to the ability to read and extract information from print sources (books, magazines, newspaper articles), digital literacy is the technological component that requires people not only to find information on the internet but also to assess sources and interpret information presented in various formats. Digital literacy also means having the skills to use technology effectively and the knowledge to do so safely and responsibly. “Digital” refers to technology, ranging from computers and the internet to devices and programs such as cellphones, smart home systems, and airport check-in kiosks. Literacy refers to the ability to use this technology—and to use it well.

Sousa and Rocha (2019) explained that there is a stake in digital skills for disruptive digital business, and they connect it to the latest developments, such as the Internet of Things (IoT), cloud technology, big data, artificial intelligence, and robotics. The topic is even more important given the large disparities in digital literacy across regions. More precisely, digital inequalities encompass skills, along with access, usage and self-perceptions. These inequalities need to be addressed, as they are credited with a ‘potential to shape life chances in multiple ways’ (Robinson et al., 2015), e.g., academic performance, labour market competitiveness, health, civic and political participation. Steps have been successfully taken to address physical access gaps, but skills gaps are still looming. Moreover, digital inequalities have grown larger due to the COVID-19 pandemic, and they influenced the very state of health of the most vulnerable categories of population or their employability in a time when digital skills are required.

Digital literacy, in the words of Blau et al. (2020), has been defined in the current literature as the competencies and skills required for navigating a fragmented and complex information ecosystem. A ‘Digital Literacy Framework’ was designed by Eshet-Alkalai (2012), comprising six categories: (a) photo-visual thinking (understanding and using visual information); (b) real-time

thinking (simultaneously processing a variety of stimuli); (c) information thinking (evaluating and combining information from multiple digital sources); (d) branching thinking (navigating in non-linear hyper-media environments); (e) reproduction thinking (creating outcomes using technological tools by designing new content or remixing existing digital content); (f) social-emotional thinking (understanding and applying cyberspace rules).

Concept of the 5th Industrial Revolution

The 5th Industrial Revolution (Industry 5.0) represents a shift towards a more human-centered and sustainable approach to manufacturing, where humans and machines collaborate seamlessly to achieve a balance between technological advancements and societal well-being. This revolution is characterized by the integration of technologies like AI, robotics, and the Internet of Things (IoT), but with a stronger emphasis on human capabilities and environmental responsibility. Industry 5.0, also known as the Fifth Industrial Revolution, is a new and emerging phase of industrialisation that sees humans working alongside advanced technology and A.I. - powered robots to enhance workplace processes.

The Fifth Industrial Revolution incorporates concepts such as “sustainability,” “human-centeredness,” and “concern for the environment” in addition to the transformation of the industrial structure through the utilization of AI, IoT, big data, etc., which was debated in the Fourth Industrial Revolution. “Industry 5.0, also known as the Fifth Industrial Revolution, is a new and emerging phase of industrialisation that sees humans working alongside advanced technology and A.I.-powered robots to enhance workplace processes. This is coupled with a more human-centric focus as well as increased resilience and an improved focus on sustainability. Concerns have been raised about the possible impacts of technological advancement, as it has been observed to displace traditional jobs and create new forms of social, economic, and technological inequality. The fifth industrial revolution will facilitate human well-being (Wang, 2019).

Encompassing more than just manufacturing, this new phase builds upon the fourth industrial revolution (Industry 4.0) and is enabled by developments in I.T. that include facets such as artificial intelligence, automation, big data analytics, the Internet of Things (IoT), machine learning, robotics, smart systems, and virtualisation. Broadening the concepts of Industry 4.0, this new industrial revolution is described by the European Union as providing “a vision of industry that aims beyond efficiency and productivity as the sole goals, and reinforces the role and the contribution of industry to society.” This is an important distinction from the approach of Industry 4.0, as described by the EU, since “it places the wellbeing of the worker at the centre of the

production process and uses new technologies to provide prosperity beyond jobs and growth while respecting the production limits of the planet.” This is a shift away from a focus on economic value towards a broader concept of societal value and wellbeing. While this concept has been touched upon in the past, through Corporate Social Responsibility for example, the notion of putting people and the planet before profits creates a new focus for industry. However, the idea of Industry 5.0 goes beyond industry to encompass all organisations and business strategies to create a broader perspective than seen with Industry 4.0.

Concept of Secondary Education Goal Attainment

Secondary education goal attainment refers to successfully reaching the objectives set for this level of education, which include preparing students for higher education and equipping them with the skills for effective living in society. This involves the successful inculcation of knowledge, skills, and attitudes needed for both academic and social success. Secondary school is the school that provides education after the education gotten from the primary schools. It is also regarded as the level of education that is derived before tertiary education. Secondary education is a crucial tier in the hierarchy of education in Nigeria. It is the midway between primary and tertiary schools. It is the form of education that students receive after their primary education and or before their tertiary education. It is intended for pupils between the ages of 11-17. Secondary Education is the budding ground for future professionals as well as the foundation for the discovery and classification of the specific fields of professions. Secondary education goals aim to prepare individuals for both higher education and useful living within society, while also equipping them with the necessary skills for effective functioning. Specifically, it aims to provide opportunities for diverse learning, prepare students for various careers, and promote national unity and values.

According to Federal Republic of Nigeria FRN (2004), the specific objectives of secondary education is to ensure that all primary school leavers are provided with the opportunity for education of a higher level, irrespective of sex, social status, religious or ethnic background; offer diversified curriculum to cater for the differences in talents, opportunities, and future roles; provide trained manpower in the applied science, technology, and commerce at sub-professional grades; develop and promote Nigerian languages, art and culture in the context of the world's cultural heritage; inspire students with a desire for self-improvement and achievement of excellence; foster National unity with an emphasis on the common ties that unite us in our diversity; raise a generation of people who can think for, themselves, respect the views and feelings of others, respect the dignity of labour, appreciate those values. The attainment of these broad and specific

goals was expected to transform the Nigerian society towards cohesion and global competitiveness (Ada et al., 2019).

Secondary schools can only achieve these stated objectives through effective schools where principals, teachers, and students are playing their expected or anticipated roles, meeting their expected targets (Owan, 2019). One area of central focus to scholars, stakeholders, and society, in general, is the attainment of school goals. This is because many secondary schools do not seem to be achieving the goals set out in the National Policy on Education (Ajeyalemi and Ogunleye, 2009). Keen observation has further revealed that many secondary leavers lack adequate vocational, technical, and entrepreneurial skills expected of students at their level.

Relevance of Digital Literacy to Secondary Education Goal Attainment

Around and within the terrains and confines of secondary education, the assessment of digital literacy skills among students has garnered considerable attention and significance. This area of study delves into adolescents' proficiency in navigating and utilizing digital tools, platforms, and information sources relevant to their educational pursuits. Despite the importance of education in real-life situations, research reports from CharlesOwaba (2021) submitted that lack of digital skills among graduates is a significant reason for unemployment in Nigeria. Charles-Owaba (2021) defined digital literacy skills as effectively using technology to find, evaluate, create, and communicate information. These skills are essential in today's digital age, as technology is critical in almost every aspect of our lives. Omeodu and Charles-Owaba (2022) identified some of the critical digital literacy skills as:

- i. Internet literacy: The ability to navigate the web and use search engines to find information.
- ii. Media literacy: The ability to evaluate the credibility and reliability of digital media sources.
- iii. Information literacy: The ability to critically evaluate and analyze information for accuracy, bias, and relevance.
- iv. Communication skills: The ability to effectively communicate using digital tools such as email, instant messaging, and social media.
- v. Cybersecurity: Protecting personal information and devices from online threats.

- vi. Digital citizenship: The ability to understand and follow ethical and legal guidelines when using technology.

The contemporary landscape of education intertwines seamlessly with technology, necessitating a comprehensive understanding and adeptness in digital literacy for students to engage, comprehend effectively, and harness information resources. Digital literacy is crucial for achieving secondary education goals by empowering students to navigate the digital world, enhancing their learning experience, and preparing them for future careers and citizenship. It fosters critical thinking, problem-solving, and communication skills, which are essential for success in both academic and professional settings. Establishing digital literacy quickly has become an important concern for today's youth.

According to a study by the Pew Research Center in the USA in 2018 (Anderson & Jiang, 2018), 95% of teens now report that they have a smartphone or access to one, and 45% say that they are online on a near-constant basis. There has, as well, been a significant increase in teenage users of social media (more than a 100% increase over the past four years). The preponderance of misinformation is also alarming. A study by Vosoughi, Roy, & Aral (2018), conducted by analyzing diffusion of news stories on Twitter from 2006 to 2017, suggests that false news spreads farther, faster, deeper and more broadly than the truth, especially for political news. And yet a report released by the Stanford History Education Group (SHEG) in 2015 (Wineburg, McGrew, Breakstone, & Ortega, 2016) shows a dismaying inability by students to reason about information that they see on the Internet (including an absence of effort to do fact checking by visiting alternate sites (Wineburg & McGrew, 2016)). Students, for example, had a hard time distinguishing advertisements from news articles or identifying where information came from. The report mentions "...students may focus more on the content of social media posts than on their sources" and also "...despite their fluency with social media, many students are unaware of basic conventions for indicating verified digital information".

The number of online courses has been constantly increasing. Educators and course managers can implement several steps to overcome the obstacles associated with online learning, for example, by providing possibilities for socialization and interaction between students and between students and teachers (Salmon, 2013) or by monitoring students' activities and encouraging struggling learners. This is especially important for less experienced online students (Shen et al., 2013). However, online courses often require students to implement self-directed learning to a great extent, which means that the burden falls upon the students to acquire

knowledge on how to study online. This demands technical skills and more importantly, digital literacy. Often, the discussion on digital literacy orbits around the technical aspect, but digital literacy is much more than that. To know how to use different hardware and software is to possess digital skills; however, digital literacy is more diverse.

To be digitally literate, one must not only be able to deal with information management, copyright licensing, ethical considerations, and digital skills but also effectively use the right digital tool for the right purpose, such as collaboration, communication, and expression (Tang & Yen, 2016). In the educational context, Udeogalanya (2022) reported that while students favor online learning, they also want to be trained in using digital tools before assignments. Exposure to digital environments plays a decisive role in being able to develop digital literacy. For example, it is easier to achieve a high level of digital literacy if one has access to the Internet at home than if one has to go to an Internet café. Such accessibility varies across different socioeconomic groups and in different parts of the world.

Generally, the importance and relevance of digital literacy in the 5th industrial revolution to secondary education goal attainment include:

Enhancing Learning and Academic Achievement:

1. **Access to Information and Resources:** Digital literacy allows students to access a vast wealth of information and resources online, supplementing traditional learning materials and broadening their understanding.
2. **Interactive and Engaging Learning:** Digital tools can make learning more interactive and engaging, particularly in subjects like mathematics and science, where interactive simulations and virtual labs can be utilized.
3. **Improved Learning Outcomes:** Studies have shown a positive correlation between digital literacy and academic achievement, with higher levels of digital literacy leading to better engagement and knowledge retention.
4. **Self-Directed Learning:** Digital literacy empowers students to take control of their learning, identify their needs, and seek out resources independently, fostering self-directed learning.

Developing 21st-Century Skills:

1. **Critical Thinking and Problem-Solving:** Digital literacy encourages students to analyze and evaluate information from various online sources, developing their critical thinking and problem-solving skills.
2. **Communication and Collaboration:** Digital literacy facilitates effective communication and collaboration with peers, teachers, and experts worldwide, preparing students for future professional and personal interactions.
3. **Creativity and Innovation:** Digital tools can inspire creativity and innovation, allowing students to express themselves in new ways and develop innovative solutions to real-world problems.

Preparing for Future Careers and Citizenship

1. **Job Market Readiness:** Digital literacy is essential for success in the modern job market, as many professions require proficiency in using digital tools and navigating online platforms.
2. **Effective Communication and Collaboration:** Digital literacy equips students with the skills to communicate effectively and collaborate with others in digital environments, which is crucial for teamwork and professional success.
3. **Active Citizenship:** Digital literacy empowers students to become informed and engaged citizens, enabling them to participate in online discussions, access public information, and contribute to democratic processes.

Addressing Challenges and Barriers

1. **Digital Divide:** While digital literacy is vital, it's important to address the digital divide and ensure that all students have equal access to technology and resources.
2. **Teacher Training:** Educators need to be equipped with the skills and knowledge to effectively integrate digital technologies into their teaching practices and support students in developing their digital literacy.
3. **Infrastructure Support:** Schools need adequate ICT infrastructure, including reliable internet connectivity and access to digital devices, to support digital learning and teaching.

Digital literacy is not just a skill to be acquired; it's an essential component of achieving secondary education goals, preparing students for a digital world, and empowering them to thrive in the 21st century.

The advent of digital transformation has precipitated significant shifts in numerous facets of life, including the domain of education. The advent of advanced information and communication technology (ICT) has ushered in a novel landscape, wherein novel methodologies for learning, teaching and interacting with information have emerged. In the context of education, digital transformation not only impacts the learning tools employed but also the pedagogical approaches, curriculum design and the competencies required for success in the global era. The ability to understand, use and evaluate digital technologies effectively and ethically, which is defined as digital literacy, is becoming one of the key competencies of the 21st century. Digital literacy is a multifaceted concept that encompasses not only technical skills such as the use of software and applications, but also more complex abilities such as critical thinking, problem-solving, and analysing digital information. In the contemporary context where technology pervades almost every aspect of life, including the professional realm as well as social interaction, digital literacy has become a basic necessity rather than a mere complement. The secondary education stage plays a pivotal role in fostering this literacy, as at this stage learners begin to engage with technology in a more autonomous and sophisticated manner (Ivanova et al., 2024).

Conclusion

Digital literacy deals with the ability to effectively understand and use digital technologies. Within the scope of education, it refers to the ability to use and apply digital technologies to educational services. The relevance of digital literacy to secondary education goal attainment cannot be over-emphasized, as they help facilitate the teaching and learning process, both for students and teachers.

Suggestions

1. Heads of schools and educational administrators should incorporate the use of technologies in schools
2. Government of countries all over the world should ensure that digital equipment are procured and provided in schools
3. The use of projectors and robotics tools should be implemented in the classrooms and in schools in general

4. Computer science must be taught in secondary schools with practical heavily included.
5. Data should be digitalized in schools to save time
6. Educational stakeholders must ensure that secondary schools within their locality have technological tools and they must be fully incorporated in all class

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