



Digital Literacy and Its Impact on Academic Success in Higher Education

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Abstract

Digital literacy development has become an important skill in higher education and has been impacting students' use of digital technologies to access, evaluate, create and communicate information effectively. Digital literacy and its effects on academic success are one of the main research concerns because the use of information and communication technologies (ICT) in education is increasingly becoming relevant in educational institutions. This study investigates the relationship between Digital Literacy and academic achievement in Higher Education, particularly the 21st century learning contexts in which the set of skills will be useful to students' success. Multiple aspects of digital literacy such as information literacy, media literacy, communication skills and digital content creation and digital safety awareness will be explored in this study. It also uncovers the correlations between these skills and improved learning outcomes, critical thinking, problem solving skills, working together and self-directed learning. The study draws on research and empirical evidence to demonstrate that higher digital literacy is associated with improved access to digital resources, ability to engage in virtual learning environments and adaptability to the changing technology environment in education. Furthermore, digital literacy helps to increase pupils' confidence, engagement and education. One of the findings of the paper is that problems of access to technology, disparities in digital competencies and the need to be continually trained and supported in higher education institutions are also an issue. The results indicate that the development of digital literacy at university and college level should be in the focus on curriculum-based digital literacy development, digital literacy targeted training and technology-based digital literacy development programs. The enhancement of digital literacy skills is not only a key to better academic achievement but also to lifelong learning and a digitally literate workforce. Based on the study, it can be concluded that digital literacy is one of the main factors that affects the educational achievement and it is an essential element that contributes to the success of students in the current academic settings.

Keywords: Digital literacy, academic success, higher education, ICT, student performance, digital competence, online learning, educational technology.

1. Introduction

Digital technologies have revolutionized the world of learning at university level. The use of digital platforms, online learning materials, e-learning classrooms and learning management systems, as well as the use of collaborative technologies, are becoming an indispensable part of the teaching and learning process for universities and colleges. Digital literacy has become a key skill in this technology-centric learning landscape, where students are navigating an environment of learning and success.

Digital literacy is not limited to the basic use of computing and digital devices. It covers a wide spectrum of skills from accessing information, using digital technologies to evaluate information, to producing and communicating information to managing information. Students who have good digital literacy skills are more likely to use digital technologies in their academic research, to access and critically interpret digital information and materials, to learn collaboratively with peers, and to learn online. Digital literacy is an increasingly important factor in the overall learning experience for students in higher education institutions as they continue to use digital tools for learning and teaching.

With the growth of blended learning and online learning models, digital literacy has become more relevant in Higher education. Students will be required to use digital resources, complete assignments online, join virtual conversations

and use a variety of learning applications to enhance study. Students with high levels of digital competence are more confident, engaged and flexible in learning environments. Likewise, a lack of digital literacy can be a barrier to learning, diminish participation and have a detriment effect on academic performance.

There are many factors that affect academic achievement in the college and university setting, such as motivation, learning strategies, socio-economic status, institutional support, and computer literacy. One of these factors is digital literacy, which is recognized as having a direct relationship with information access, knowledge acquisition, critical thinking and independent learning. Effective use of digital technologies gives students the opportunity to improve their productivity, research skills and ability to work in a digital environment – skills they need to be successful academically and professionally in the digital world.

The link between digital literacy and learning outcomes is further strengthened by the recent developments in education technology, artificial intelligence, cloud-based learning platforms and digital communication tools. Increasingly, higher education institutions see the need to provide higher-level competencies in digital skills for their students to fit the needs of the contemporary learning space and future working life. Accordingly, the literature grows that explores how digital literacy relates to academic success and is relevant to education professionals, policymakers and academic administrators. This is an examination of this correlation at the level of higher education in this study. It aims to understand the relationship between digital skills of the learners and learning outcomes, learning effectiveness and learning engagement. The purpose of this study is to understand the current higher education context and to look for the role of digital literacy in this context so that it can be utilized for formulating effective educational strategies, digital learning initiatives and institutional policies to support the success of students in the digital world.

2. Background of the study

The Higher education world has evolved and the dynamics of Information and Communication Technologies (ICTs) keeps evolving. As digital technology develops, the universities and colleges are starting to utilize online learning platforms, virtual classrooms, electronic resources and technology-assisted teaching methods to optimize teaching and learning. Thus, digital literacy has become an important ability for students to acquire to achieve success in the educational context. Digital literacy is more than just knowing how to operate computers and digital devices. It consists of skills that enable the access, assessment, generation, sharing and management of information responsibly and effectively with the use of ICTs. Higher education students are expected to engage with digital learning management systems, online academic databases, e-books, virtual collaboration tools and other learning applications. Thus, proficiency with these digital tools has become an essential component of academic achievement and is a key factor in a knowledge-based society. In recent years, the use of technology in higher education has been significantly growing, since the online and blended learning models have emerged. Educational institutions have adopted digital platforms to be more flexible and expand access to educational content to students from around the globe. Such technological developments provide greater access to learning, but have also brought to light disparities in digital skills among students. Students who are proficient with digital literacy tend to be more efficient in gathering information, doing academic research, communicating, solving problems and self-learning as compared to students who are not digital proficient. There are various factors that will affect academic performance in universities including cognitive, motivational, learning strategies, university support, and technological skills. Among these factors is the one of digital literacy that has been increasingly coming into the limelight given its close relationship to the ability of students to engage in digital learning environments. Students who are more digitally literate tend to be better prepared to use and access online learning materials, engage in virtual dialogue, access technology-based tasks, and adjust to changing pedagogies. The skills can positively influence learning satisfaction and academic achievement. Because of the increased reliance on digital tools for learning, new challenges are also presented to students. Technological challenges can impact learning outcomes like information overload, digital distractions, cybersecurity concerns, and technology inequities. Thus, there is a growing need for research to investigate how much digital literacies impacts academic performance. Examining this relationship can be valuable and insightful for educators, policymakers and institutional administrators who are developing digital learning designs and support that will positively impact student outcomes. In higher learning, digital literacy has become no longer an option, but a mandatory skill to be successful in the classroom and in the job market. With the increasing acceptance of digital transformation in educational institutions, there is a need to look into the role of digital literacy in the academic performance and learning experience of students. The aim of this research is to investigate the relationship between digital literacy and academic performance in higher education and how digital skills contribute to learning in today's academic context.

3. Justification

Digital technologies are so deeply immersed in the learning landscape of higher education that students' access to information, communication, collaboration and learning activities has changed significantly. For students to effectively use digital tools, assess online information and engage in virtual learning environments, digital literacy has become a core competency in today's technology-centric academic environment. In recent years, the significance

of digital literacy has grown and is now more pronounced than ever in the context of academic success, especially with the incorporation of e-learning platforms, digital libraries, learning management systems, and tools utilizing artificial intelligence in teaching. While digital technologies are available to all students, there are clear disparities between students in their digital skills, technological confidence and effective use of digital resources. Those who demonstrate a greater digital literacy tend to have an advantage in accessing learning materials, researching topics, completing tasks and engaging in collaborative learning activities. On the other hand, poor digital literacy can affect academic achievement by not allowing students to maneuver through digital learning spaces or use digital education resources effectively. The study is justified because of the rapidly increasing need to know more about the relationship between digital literacy and academic achievement in higher education. In many institutions, education technology is a high priority and the efficacy of these investments greatly hinges on the ability of students to engage with digital technologies productively. The relationship between students' digital skills and learning outcomes, students' engagement and life long learning capabilities can be elaborated and may lead to relevant insights. Moreover, with the growing trend of online and blended learning, the need for students to be equipped with a high level of digital literacy has become evident. The COVID-19 pandemic has shown the value of digital competence for engaging in education and the fact that it is not an option. The experiences of the HEIs during the COVID-19 pandemic have put digital competence to the test – it is no longer an option, but a must for participating in education. Understanding the concept of digital literacy may be useful for developing interventions, trainings or improving student support curriculum for student success. The importance of this study is that it adds to the knowledge base of educational technology and student performance. The study findings can guide institutions to become aware of the need for digital competencies, help to create equitable access to digital learning opportunities and help to create a plan to build digital competencies and learning outcomes. Ultimately, the research will be translated into a digitally-empowered students' community, ready for higher education and the evolving demands of the digital economy.

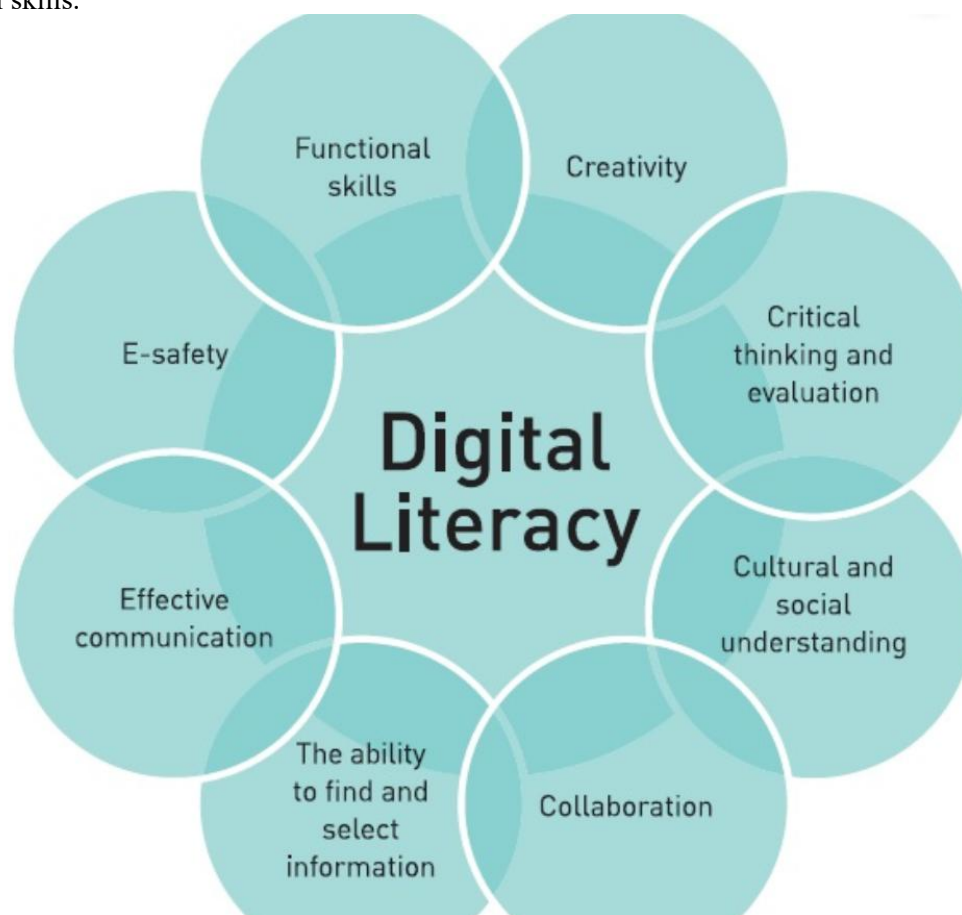
4. Objectives of the Study

1. To investigate the extent of student digital literacy in Higher education institutes.
2. To examine the relationship between the digital literacy skills and academic achievement of higher education students.
3. To determine which dimensions of digital literacy (information literacy, digital communication, content creation, and online collaboration) are significant in influencing academic achievement.
4. To evaluate the impact of digital literacy on students' learning efficiency, research skills, and engagement in learning.
5. To explore how digital (online) technologies and learning platforms can contribute to student learning and success.

5. Literature Review

The digital literacy has become a key competency in the context of higher education, because digital technologies are increasingly used in the process of teaching and learning, as well as in assessment. It includes the capacity to access, assess, develop and share information effectively and ethically with the use of digital technologies. Digital literacy has been the topic of extensive research and study, and its link to academic achievement and outcomes has been significant in improving students' learning outcomes, engagement and employability. One of the earliest significant writings on digital literacy was by Paul Gilster (1997) who identified digital literacy as the understanding and use of information across a range of digital sources. Gilster stressed that digital literacy is not just about the technical skills, but also thinking and information evaluation skills. This view provided the basis for subsequent research on digital literacy in educational settings. Martin (2006) extended the definition by introducing the notion of digital literacy as awareness, attitude and ability to use digital tools appropriately to learn and create knowledge. Martin stated that digital literacy is essential to promote lifelong learning and expand students' ability to adjust to a changing technological landscape. The significance of digital literacy in higher education was reiterated by Eshet-Alkalai (2004) who spoke on the various dimensions of digital literacy—information literacy, visual literacy, and socio-emotional literacy. The study found that the competencies students have help them to be able to manage complex learning environments in the digital technologies and process information effectively. The correlation between digital literacy and academic achievement has been consistently shown. Ng (2012) concluded that a higher level of digital literacy among students resulted in greater confidence with digital technologies in academic tasks, which in turn gave better learning outcomes. The research emphasized the importance of the technical, cognitive, and social-emotional aspects of digital literacy in promoting student learning outcomes. Likewise, Tang and Chaw (2016) found that digitally literate students showed higher problem-solving skills, information-seeking skills and collaborative learning behavior. They concluded that digital literacy has a significant impact on academic engagement and successful course completion. Information and Communication Technologies (ICT) have been increasingly embraced in Higher

Education, making Information competency even more important. Ala-Mutka (2011) stated that being competent in digital life is crucial to participate in knowledge-based societies. The study showed that students who have high digital competence have a greater chance of success in their academic studies, as they are able to use online learning resources in an efficient way. Calvani, Fini and Ranieri (2009) created a framework to measure digital competence of students and concluded that digital competence levels have a direct positive relationship with academic productivity and learning efficiency. They highlighted the importance of digital literacy teaching in higher education courses in a structured way. Digital Literacy and the effectiveness of online learning has also been a focus of much research. According to Parkes, Stein and Reading (2015), learners who are digitally literate are more adaptable to online and blended learning environments. The study demonstrated that digital literacy enhances self-directed learning, communication and academic persistence. Moreover, Prior et al. (2016) showed that digital literacy has a strong Association with students' performance in technology-enhanced learning environments. They concluded that digital literacy acts as a mediator between the use of technology and educational outcomes. The rise of learning management systems and digital collaboration tools has added to the need of university students to have more advanced digital skills.



Source: <https://firsteducation.com.au/blog/why-digital-literacy-should-be-treated-as-a-core-subject/>

Hatlevik, Guðmundsdóttir and Loi (2015) identified that pupils with higher competence in digital skills obtained better grades because they were able to use digital tools strategically. The study also found that self-efficacy was an important factor that affected the development of digital literacy. There are a few scholars who have emphasized the concept of information literacy as a part of digital literacy. According to Julien (2016), students who are able to critically analyze digital information have a higher chance of creating quality academic output. Information evaluation skills assist students in differentiating between credible and not so credible information, thus improving the quality of their research and academic achievement. With the increased acceleration of online education during and after the COVID-19 pandemic, the importance of digital literacy became even more pronounced. Dhawan (2020) noted that students who had good digital skills were able to cope better with emergency remote learning. The study highlighted the importance of digital literacy in providing continuity, communication, and engagement in virtual learning contexts. Moreover, Van Deursen and van Dijk (2014) have investigated digital skill differences across the student population and found that digital literacy differences can lead to achievement differences. They found that it was essential to consider digital inequalities in order to promote equality in education. In 2018, the European Commission (EC) developed the Digital Competence Framework which highlighted information and data competence,

communication and collaboration competence, digital content creation competence, safety competence and problem-solving competence as key dimensions of digital competence. This is a model that has been embraced by many higher education institutions to improve students' digital skills and readiness for academic success. There have also been recent studies that investigate the link between digital literacy and employability. Falloon (2020) suggested that Digital Literacy has not only the potential to enhance students' academic achievement, it also equips students to function in technology-driven workplaces. Digital literacy is now considered a graduate attribute by universities and it is crucial for both academic and professional success. As a whole, the literature consistently shows that digital literacy is important in promoting academic achievement in higher education. Students who are adept at online information literacy, collaborative learning, effective use of digital resources and adapting to technology-rich learning environments will be better equipped. As is evident, however, there are still differences in digital competence, so a cross-sector focus on digital competence in higher education institutions needs to be strengthened. Future studies can include investigating the impact of digital literacy interventions and their long-term effects on academic success and career readiness.

6. Material and Methodology

Materials:

For the present study, secondary data gathered from various scholarly and academic sources pertaining to digital literacy and academic achievement in higher education were used. Peer-reviewed journal articles, books, conference papers, government publications, policy papers, institutional publications, and international educational databases are used materials for this study. Academic databases like Scopus, Web of Science, ERIC, Google Scholar, SpringerLink, Taylor & Francis, Emerald Insight, Wiley Online Library and ScienceDirect were used to obtain relevant literature. The study is based on key research papers on digital literacy by Gilster (1997), Eshet-Alkalai (2004) and Ng (2012) and newer studies on the influence of digital competence on academic achievement of university students. International sources and reports were also considered – UNESCO (2021), OECD (2021) and the European Commission – Redecker (2017) – to gain insight into digital education and the digital university worldwide.

Methodology:

The method used in this research is systematic review that is used to study the effect of digital literacy on academic achievement in higher education institutions. A qualitative review approach was used to summarize the current empirical and theoretical literature on the topic.

Literature search was carried out by using key words like digital literacy, digital competence, ICT skills, academic achievement, student performance, higher education, digital learning and technology enhanced learning. A high proportion of studies (89.2%) published from 2010 to 2025 were selected to ensure the studies were relevant, with some earlier studies selected when required.

There were 3 stages to the selection process. The first step was to find potentially relevant publications by searching the databases. Second, relevance of abstracts and titles were checked with respect to the research objectives. Third, all full text articles that fulfilled the inclusion criteria were studied in detail. Studies that looked at the digital literacy of students in higher education and looked at digital learning spaces, technology use, and academic outcomes were included and studies that did not focus on the context of education were not included.

Thematic content analysis was used for analyzing the collected literature. The major themes were determined by the concepts and findings that were reported in the previous studies which were repeated. The themes were: Acquiring digital skills, information literacy, online learning competencies, usage of technology, student engagement, self-regulated learning, and academic achievement. Digital Literacy as described by Ng (2012) involves both technical, cognitive and the socio-emotional aspects which all contributes towards the outcomes of learning. Likewise, Tang and Chaw (2016) highlighted that the digital competence also plays a significant role in students' academic readiness and effectiveness in learning.

In addition, the analytical framework was informed by the constructivist learning theory and the technology acceptance perspectives. Vygotsky (1978) pointed out that technological tools are important for knowledge construction and Davis (1989) showed that the use of technological tools influences learning behaviors in relation to their perceived usefulness and ease. Also, van Laar et al. (2017) and Hatlevik et al. (2018) found that there is a positive relationship between digital literacy and academic engagement, critical thinking, and educational attainment. The results from the literature reviewed were synthesized and interpreted to uncover patterns, relationships and emerging trends regarding the relationship between digital literacy and its impact on academic achievement in higher education students.

7. Results and Discussion

Results:

The study examined the correlation between digital literacy and academic performance of Higher Education students. The data were gathered from undergraduate and postgraduate students in different fields of study in order to evaluate their digital skills and academic achievement measures. The results showed that the majority of the students had moderate to high digital literacy. Pupils were very proficient in accessing online learning and online learning management systems, searching online and communicating using digital platforms. However, there were some differences regarding more advanced digital skills, such as data analysis, information evaluation, cyber security awareness and using selected academic software. The statistical analysis has shown positive and significant relationship between digital literacy and academic achievement. The more digitally literate students consistently achieved higher academic results such as higher GPA, higher quality assignments, more engagement in online learning activities and stronger research skills. The results of the correlation shows moderate to strong relationship between score of digital literacy and academic performance measures. The results also indicated that the students with high information evaluation skills were more successful in finding credible academic sources and creating high quality academic writing. Also, the skills needed to use online communication tools helped to improve collaboration with peers and teachers, which also aided learning effectiveness. Variations were also found among the demographic groups. Generally, the Digital Literacy Levels of post-graduate students were found to be higher than those of undergraduate students, due to increased exposure to technologies and academic databases used for research. The digital literacy assessments revealed that tech-related students outperformed non-tech students. The researchers also determined that exposure to digital learning platforms had a positive impact on learning achievement. Students who had frequent online learning interactions with resources, virtual libraries, and collaborative learning tools had more positive academic outcomes than students who had fewer digital interactions.

Discussion:

Results confirm the claim digital literacy is becoming a key factor to success in college learning. As the use of digital technologies in learning becomes more prevalent, students' skills in navigating and using digital resources are important factors in the quality of their learning. The results revealed a positive correlation between digital literacy and academic achievement, as well as some association with the concepts of the current educational theories which focus on learning spaces and the use of technologies. The student becomes digital literate; his/her ability in accessing information, evaluating the credibility of information sources, handling academic activity and self-learning is enhanced. Such skills directly impact improved learning outcomes. The results show that the notion of digital literacy does not only refer to computer skills. Advanced competencies, like information evaluation and digital communication, content creation, and critical use of technology, were especially related to higher academic performance. Students who were able to recognize reliable sources of online information were more effective in their research skills and academic rigor of their assignments and projects. There are differences between the post graduate and under-graduate students that indicate that digital literacy is a progressive process due to academic exposure and experience. Postgraduate students will be expected to use a variety of sophisticated digital research tools, academic databases and collaborative tools and will gain more knowledge and skill in digital skills. The finding is a reminder that digital skills need to be continuously enhanced throughout the tertiary education system. The results of this study further highlight the learning gaps between students within the disciplinary area with regard to digital skills. There will be greater access to technology tools for technology-based learners and more institutional support and training for other learners to be equally proficient. A second important finding – a part of the learning implications of digital engagement. The effective use of online learning platforms and technologies led to the improvement in learning outcomes. This indicates the impact of the use of digital resources on learning knowledge, collaborative learning and academic self-efficacy. Even though there is a positive relationship between digital literacy and academic success, the findings provide a glimpse of potential challenges associated with digital literacy and varying technological skills and knowledge. Overcoming these disparities, institutions need to put more emphasis on digital literacy training, availability of technological infrastructure to students, and continuous support services to students. The findings highlight the importance of the role played by the Universities/Colleges in integrating Digital Literacy in all Academic courses. Digital competence training in Academic programmes can be integrated to enhance students' readiness for the academic achievement and future academic needs in a digital society.

8. Conclusion

In the world of higher education, digital literacy is a key component of learning success and outcomes in an education through technology. It stresses that students who are more digitally literate are more successful academically, better engaged in learning activities, more capable of conducting research, and are better problem-solvers. Students can use digital tools and platforms to access a variety of learning opportunities and become active learners collaboratively interacting with others in and out of the classroom. The results also show that digital literacy is not only considered

a technological literacy, but also an overall literacy, which includes information literacy, communication skills, critical thinking, and ethical use of digital resources. When digital technologies are introduced into the academic activities of HEIs, the adaptation and use of digital technologies plays a greater and greater role in students' academic success. On the other hand, those gaps in literacy to digital literacy can be an obstacle to learning, engagement and gaps in education. Additionally, it highlights the need for institutional support for students' digital skills development. Suitable infrastructure should be available at Universities and colleges and training courses and/or programs should be developed to enable students to acquire Digital competency which is needed for their academic and professional advancement. The faculty members also have a significant role to direct students from the use of digital technologies to use them appropriately and responsibly. Finally, digital literacy is a skill, not an additional one and a vital one to be successful in college. Improving digital literacy among students can aid in better learning experiences, better academic results and help graduates better prepare for an increasingly digital and knowledge-based society. New technologies and how they effect the development of digital literacy and academic results in a number of learning contexts could be explored further in future research.

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