E-learning and digital culture: evaluating the level of digital proficiency in an educational setting

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Abstract:
The importance of distance learning has been highlighted by the COVID-19 pandemic, as it allows education to continue even when physical presence is not possible. In today's digital age, having strong digital skills is crucial for success in the job market, especially with the rise of remote work. However, the Ministry of Higher Education faces challenges in transitioning to distance learning, such as the digital divide and the need for learners to adapt to new technologies. To overcome these obstacles, it is necessary to develop a strong digital culture by assessing digital literacy and identifying areas for improvement. Our goal is to evaluate the digital culture of students in order to enhance remote learning, which can greatly contribute to personal and national development in the digital era.
Keywords: e-learning, digital culture, digital divide, appropriation, information and communication technology

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1. INTRODUCTION

Distance learning, with no physical constraints between teacher and learner, has proved crucial in unforeseen situations such as the Covid-19 crisis. This mode of teaching, referred to as 'non-presential', highlighted the importance of this pedagogical approach in circumstances where a physical presence was impossible.

In these various distance learning methods, learners are often encouraged to carry out learning activities independently. This process fosters the development of their autonomy in learning, leading them to increase their independence in their training (Holec, 1997). It is therefore imperative to

transform learning into an educational culture rooted in digital technology in order to prepare individuals with the skills they need for the future.

In this context, the Global Center for Digital Business Transformation highlights the risks of disruption in the field of education, with a direct impact on jobs. The Future of Employment 2020 report confirms this trend, with 84% of organisations in the process of digitising and 83% planning to use remote working (World Economic Forum, 2020). Mastering digital skills is therefore becoming essential to remain competitive in the job market. What's more, the ability to manage remote working has become crucial for many organisations, as the same report points out. A strong digital culture is needed to enable individuals to collaborate effectively online, communicate clearly and coherently, and maintain productivity in a virtual working environment.

2. Research issue

Following the implementation of distance learning in Algeria during the Covid pandemic, the Ministry of Higher Education has recognized the importance of maintaining this teaching method alongside traditional in-person classes. As a result, the Algerian government has decided to offer cross-disciplinary modules through distance learning. To ensure the success of this approach, a national committee will be established to monitor distance learning in all Algerian universities beginning in December 2022 (SDN, 2022).

This decision aims to build upon the progress made during the Covid crisis, while also considering the unique needs of the new generation, often referred to as the "digital native generation". It is important to acknowledge that the success of this experiment has been influenced by the various challenges faced by educators and students. Students are encouraged to familiarize themselves with digital tools, such as the Moodle platform, which are essential for distance learning.

This requirement necessitates additional effort from learners to gain proficiency in these digital tools and effectively incorporate them into their educational experience.

The digital divide presents a significant challenge as some learners face obstacles while others do not. This discrepancy in experience and performance hampers the effectiveness of distance learning. Students may also struggle with using different web applications to access the dedicated online learning platform, as they are unfamiliar with these methods of communication. Limited digital infrastructure and poor connectivity further contribute to this divide. Additionally, adapting to digital tools and addressing disparities in their usage requires extra effort to fully integrate them into the learning process (Bouguerne & Keskes, 2022). This poses a major challenge to the success of distance education. Therefore, it is crucial to establish a strong digital culture among all those involved in distance learning. To ensure the continuity of distance education, it is essential to assess digital literacy in order to identify strengths, weaknesses, and opportunities for improvement. It is undeniable that the digital environment plays an increasingly important role in both individual and social life, emphasizing the significance of digital literacy.

The digital era presents fresh chances for developing a novel kind of individual who is adaptable to the digital landscape. All parties involved must have a comprehensive understanding of the present obstacles tied to educational achievements, as well as the forthcoming challenges linked to the job market and ongoing digital changes (Sitaridis et al, 2024). To enhance individual and national progress, our study seeks to evaluate students' digital literacy and pinpoint areas that require improvement. This assessment aims to bolster the crucial digital literacy skills necessary for advancement.

3. Theoretical framework

The rise of digital culture is often associated with a set of practices that rely on the increased use of communication technologies. This digital culture encompasses the changes brought about by the introduction of digital, networked, and personalized media in our society, transforming the way we interact and present ourselves. It is important to note that students who use

computer-based educational programs develop a higher level of self-educational skills and utilize new technologies.

However, the acquisition of digital skills can be influenced by various factors related to the societal context in which individuals live, particularly their beliefs and the accessibility of digital technologies. The term "digital literacy" was first introduced in the 1980s, and different attempts have been made to define it. For instance, in his book "Digital Literacy" published in 1997, Paul Gilster views digital literacy as the ability to comprehend and utilize information presented by computers in different formats and from various sources (Gilster P. & Glister P., 1997). This definition emphasizes individuals' ability to use and leverage IT tools. Nevertheless, other authors highlight additional aspects of digital literacy that go beyond the mastery of IT tools. The specific ways of thinking, representations, and meanings that are unique to a particular group are fully integrated with material objects.

Digital culture, encompasses the various ways in which we use and value digital tools, as well as the skills we develop in information and communication through these devices (Pélissier, 2013). It is important to recognize that discussing digital culture should not assume that everyone has the same level of proficiency in using digital tools, as this can be risky. Instead, Pélissier suggests referring to "digital cultures" to acknowledge the differences in mastery, usage, and values.

From these components, it becomes evident that digital literacy goes beyond technical skills in handling information. It should be viewed as an essential aspect of a person's overall literacy, incorporating an understanding of the information-based world. Moreover, analysing digital literacy necessitates considering the socio-technical nature that equips individuals to function in the digital society. This understanding is crucial for the formation and growth of digital literacy. The challenges associated with computerization, training, and the development of digital culture involve both technical and human aspects. The digital divide is a complex issue that requires a comprehensive understanding of the social and cultural contexts that underpin it. When evaluating proficiency in digital skills, it is important to consider not just the ability to use and access technology, but also how it affects people's lives and

future opportunities. Furthermore, when creating an assessment framework, it is vital to acknowledge the various technical and socio-economic/cultural factors that influence digital literacy.

A. The social, economic, and cultural aspect:

When considering the social and cultural aspect, we believe that the following factors can be used as relevant indicators to measure digital culture:

1. The impact of socio-economic status in families and schools

The disparities in access to digital technologies are mainly influenced by economic inequalities among individuals, particularly within families. This, in turn, affects the school environment. The availability of financial and educational resources at home, as well as the quality of education in schools, play a crucial role in determining whether individuals have access to digital technologies and can use them effectively (Warschauer, 2004).

Moreover, it has been observed that the level of education of parents is closely linked to students' proficiency in information and communication technology (ICT). This proficiency, in turn, positively predicts their ability to solve ICT-related problems and address ethical issues associated with its use. Various research studies, such as the one conducted by Feng and Tan (2024), have shown that there exist three levels of disparities in technological access, as outlined below (Feng, 2024).

The first stage of the digital divide is strongly connected to the socio-economic status of families, focusing on the unequal availability of technology and internet access (Selwyn, 2004). When comparing rates of household ICT access, the disparities become evident. In 2021, there will be a staggering 4.9 billion Internet users worldwide, which means that nearly two-thirds of the global population are currently connected to the World Wide Web. However, the Internet usage rate is at 90% in North America and Western Europe, while only 28% of individuals in the Middle East and Africa have access. The second aspect of digital inequality revolves around the ability to effectively engage with and benefit from digital technologies (Hargittai, 2001). In particular, students from more privileged socio-economic backgrounds were more inclined to actively utilize the Internet for educational purposes, while their counterparts from less advantaged

backgrounds tended to use it predominantly for entertainment and were more interested in the social and relational aspects of these platforms (Zhang, 2015). The impact of digital literacy reaches beyond just technological know-how. It also includes difficulties in communication, research, and understanding information. These challenges have broader implications, affecting both social and professional aspects of life.

B. Technical dimensions:

The technical aspect concerning the adoption of information and communication technologies (ICT) plays a vital role in contemporary society, encompassing various factors that can serve as indicators for assessing digital culture:

1) Utilization and proficiency in digital skills:

Digital competence involves the ability to critically analyze online information, conduct research, and evaluate digital content (Boltanski & Chiapello, 2002). It also includes the capacity to safeguard personal data and privacy online, adhere to ethical conduct guidelines, employ digital tools in a creative and innovative manner, and generate digital content. It is important to note that the absence of content that fulfills users' genuine needs generally restricts the utilization of digital technologies (Dimaggio & Hargittai, 2002).

2) Enhanced accessibility through user-friendly interfaces:

The advancement of digital technologies has resulted in more intuitive interfaces, making devices easier to navigate even for those with limited technological expertise. This diminishes barriers to entry, enabling a greater number of individuals to benefit from digital technologies and fostering a greater commitment to continuous learning and adaptation among users (Ragnedda & Mutsvairo, 2018). The motivation behind using ICT is strongly influenced by an individual's position in society (Ragnedda M. & Ruiu M. L., 2017). Additionally, the availability of relevant content greatly impacts the utilization of digital technologies. Public policies and governance initiatives can play a vital role in promoting the use of ICTs by improving access to services and supporting their growth, such as e-administration and e-payment. By benefiting from various e-services, individuals contribute to the

advancement of their digital literacy and the development of their community (Robinson et al, 2015).

3) The vital role of schools in fostering digital skills:

Schools have a pivotal role in nurturing students' digital social and cultural knowledge. Simply providing IT resources is insufficient; it is crucial to fully integrate digital technologies into educational processes to promote interaction, collaboration, and the creation of innovative works (Cormerais et al, 2017). Additionally, teachers are emerging as crucial contributors to the digital transformation of society by actively participating in the development of educational content (Larson, 2015).

Based on the aforementioned, we propose the following hypotheses to gauge the impact of digital culture on the enhancement of distance learning:

Hypothesis H1: The socio-economic and cultural background of students positively influences the acquisition of a digital culture that supports high-quality distance learning.

Hypothesis H2: The level of students' usage positively influences the acquisition of a digital culture that supports high-quality distance learning.

4. The research approach

In order to analyze the impact of digital literacy on e-learning, a purposive sampling method was utilized to select a diverse group of students who have taken online courses. Specifically, only students who had participated in distance learning courses were included in this study. To gather data, a questionnaire was created and distributed online through Google Forms. This method was chosen to ensure impartiality and maintain the confidentiality of the participants. Prior to completing the questionnaire, participants were fully informed about the study's objectives and were encouraged to provide truthful and comprehensive responses. The study included 622 students, aged between 18 and 22, with 172 (15%) being male and 450 (85%) being female. These demographics offered a well-rounded

and representative perspective for the examination of digital culture and its influence on e-learning.

To assess and gauge digital culture within an educational setting, we propose an evaluative framework consisting of two primary dimensions: the socio-economic and cultural dimension, and the technical dimension and utilization of technology.

The socio-economic and cultural dimension encompasses the following indicators:

1) The income of parents.
2) The education level of parents.
3) The support and assistance provided by parents in education.
4) Interest in utilizing technology for educational purposes.
5) Interest in utilizing technology for social interaction.
6) Interest in utilizing technology for entertainment.
7) Interest in utilizing technology for job searching and personal growth.

The technical and usage dimension encompasses the following indicators:

1) The availability of technological tools such as computers, smartphones, and tablets.
2) Access to the internet and the specific type of connection.
3) The ability to safeguard personal information online, particularly when opening emails or creating social media accounts.
4) The perception of acquiring skills in using new technologies.
5) The ability to adapt to new technologies.
6) Benefits derived from technology usage, such as online registration, electronic payments, online shopping, and e-learning.
7) The type of computer training received in high school, including word processing, calculations, and creating presentations.

The purpose of this evaluative framework is to gather pertinent data that can enhance distance learning by identifying students' digital culture needs and capabilities.

5. Results and data analysis

The analysis of the data gathered from the questionnaire, which was distributed via Google Forms and made available on the Facebook page of the Humanities and Social Sciences department, reveals that a total of 622 students were surveyed. Out of these, 512 students provided responses, resulting in a response rate of 82%. This rate of response is considered satisfactory and suggests a commendable level of student engagement in the survey. The active participation of the participants indicates their commitment to the research and their eagerness to contribute to the findings of the study. This further enhances the reliability and precision of the collected data, establishing a solid basis for the analysis and interpretation of the results.

The survey findings offer valuable insights into the socio-economic and educational background of the participants, as well as their perception and use of information and communication technologies (ICTs). It is important to note that a majority of respondents (57%) reported a family income above the minimum wage, indicating a certain degree of financial stability in their households. Regarding parental education, a significant portion (50%) stated that their parents had completed secondary education, while 32% had obtained a university degree or higher.

In relation to students' digital literacy growth, the findings show that most parents (58%) solely provided financial aid, suggesting a limited direct involvement in educational endeavors. This observation appears consistent with the previously mentioned higher levels of parental education. As for the inclination towards utilizing ICTs for learning, a majority of students (60%) displayed a moderate level of interest, indicating a considerable opportunity for incorporating these tools into the educational journey.

In order to make the most of these technologies, it is essential to have a certain level of understanding. When it comes to using ICT for socializing and entertainment, 40% of participants stated that they frequently use it, highlighting the importance of digital media in their daily lives. However, when it comes to utilizing ICT for job hunting and personal growth, only 40% of participants expressed a positive inclination. This could be because they

are first-year college students with an average age of 20.

The results and analysis of the technical and usage aspect show that the majority of participants (70%) rely solely on smartphones as their technological tools. This heavy reliance on smartphones may impede digital transformation in the socio-economic sector, as it limits opportunities for the adoption of other technological devices. Furthermore, the survey reveals that most students (80%) have limited access to the internet through a 3G/4G modem, which may restrict their access to online content that requires high-speed broadband.

When it comes to safeguarding personal data, approximately 30% of students lack confidence in their ability to protect their data online. This underscores the need for increased awareness and education on digital security.A need for educational programs that better suit their needs has been emphasized by students, who are eager to learn new technologies. Interestingly, almost half of the students (45%) believe that they can easily adapt to new technologies, which suggests that the use of distance learning technologies may be facilitated.

Despite the widespread use of technology, the benefits derived from it are mainly limited to pedagogical and relational aspects for the majority of students (57%). This indicates a lack of overall digital culture among the participants.

A survey conducted in high schools revealed that 50% of the participants had gained basic computer skills, while only 20% had received advanced training. A significant 30% admitted to not having received any computer training, which could hinder their proficiency in using technology. These results highlight the importance of implementing a comprehensive IT curriculum from the early stages of education in order to foster the development of a more advanced digital society.

6. Discussion of the findings

Based on the data provided, it seems that the initial hypothesis is somewhat supported. The results indicate that most students' parents earn more than the minimum wage and a significant number of them have

completed secondary or university education. These socio-economic and cultural factors may encourage students to develop a stronger digital culture.

Indeed, financial stability and higher levels of parental education may indicate a family environment that embraces the use of information and communication technologies (ICTs) in everyday life. However, it is worth noting that despite this positive trend, a significant percentage of students (58%) rely solely on financial support from their parents, which could suggest a lack of direct assistance for educational activities. This could potentially hinder the positive impact of socio-economic and cultural factors on the acquisition of a digital culture that promotes high-quality distance learning.

As for the second hypothesis, which focuses on the extent of student usage that can enhance the development of a digital culture that supports excellent distance learning, it appears to be partially confirmed.

The findings demonstrate that students utilize information and communication technologies (ICT) for both learning purposes and for socializing and entertainment.

The students have a sense of confidence in their ability to adapt to new technologies. This implies that students who use technology more frequently are more likely to have a digital culture that supports high-quality distance learning. However, it is important to note that most students only have smartphones, which may limit their access to more advanced online content that requires other tools.

Furthermore, a third of students feel unsure about protecting their personal information online, indicating a need for education and awareness regarding digital security. These factors could potentially have an impact on the effective utilization of technology in distance learning.

The findings from the survey propose several actions that can be taken to promote a digital culture and accomplish digital transformation. It is crucial to utilize the favorable socio-economic and cultural factors that have been identified, such as the higher income levels of most parents and their significant levels of secondary or university education.

These elements can serve as a solid foundation for integrating

information and communication technologies (ICTs) into students' everyday lives. To achieve this, it would be advantageous to implement policies that encourage the use of microcomputers at home, drawing inspiration from past successful initiatives like Algeria's Ousratic program in 2005 (Boualili, 2011). The primary objective of the Ousratic program was to provide computer and Internet access to every 'ousra' family, along with banking services for their purchases. The aim was to expand the technological resources available to students and inspire them to immerse themselves in a digital environment that supports learning.

In addition, it is important to make microcomputers easily accessible on college campuses, in order to diversify students' practices and applications. These initiatives greatly contribute to expanding online learning opportunities and enabling access to a wider range of diverse and complex content, ultimately enhancing their digital literacy.

At the same time, there is a need to develop programs that raise awareness about digital security and provide training to students, helping them feel more confident in protecting their personal data online.

It is essential to prioritize the protection of our environment. Furthermore, we must develop effective distance learning methods that fully utilize technology, taking into consideration the diverse abilities and needs of students. By implementing appropriate educational programs and awareness campaigns, we can encourage a more widespread and productive use of technology in distance learning. This will, in turn, foster the growth of a stronger digital culture that can drive the digital transformation in education and other sectors.

7. Conclusion

In summary, the examination of the findings presents a complex yet promising outlook for integrating digital culture into distance education in Algeria. The identified favorable socio-economic and cultural factors lay a strong foundation for increased use of information and communication technologies (ICTs) in student life. However, there are still challenges to overcome, particularly in terms of technological access, digital security, and student confidence in using ICT. To address these challenges, several

suggested actions include expanding computer access in homes and on university campuses, and implementing digital security awareness programs to build students' trust in online technologies. Additionally, distance learning strategies should be tailored to meet the diverse needs and abilities of students, fully harnessing the potential of ICT.

This analysis also highlights the socio-economic and technical disparities among students, emphasizing both opportunities and difficulties in integrating technology into education. It underscores the importance of ensuring equal access to technological resources and promoting digital literacy, while recognizing the significant influence of socio-economic factors on the development of inclusive education policies.

The ability to effectively utilize the potential of information and communication for meaningful individual, societal, and political endeavors is of utmost importance.

The use of technology and the way we communicate are both important factors in shaping how we interact with each other. By bringing these elements together, we can improve students' ability to use digital tools and skills. This, in turn, will help drive the digital transformation of education and society as a whole in Algeria. To achieve this, a well-thought-out strategy and coordinated efforts at all levels are needed to prepare students for the ever-changing digital world and to ensure that Algerian society benefits from having a population that is technologically competent.

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