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ORIGINAL ARTICLE

Culture of digital literacy in university students

Cultura de la alfabetización digital en estudiantes universitarios

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Abstract

In the contemporary era, characterized by the omnipresence of technology and the growing influence of digitalization in all aspects of life, digital literacy has become an unavoidable imperative. University students, as part of the generation that has grown up immersed in the digital world, they are at the epicenter of this transformation, so digital culture in university students represents a set of attitudes, values, knowledge and practices related to the use of technology in daily and academic life. Objective: analyze the culture of digital literacy in university students studying medicine. A descriptive, observational and transversal study was followed, the data was collected through a questionnaire in Microsoft Forms applied to 320 students, resulting in: attitude in relation to new technologies being good because the familiarity of the use of these in daily life has facilitated their inclusion in education. The use of ICT represents invaluable support for students by facilitating their research in the scientific and medical field, since it gives them the ability to search for updated information in these fields and, at the same time, develop skills in the processing and management of data.

Keywords: digital literacy; culture; students; university students

Resumen

En la era contemporánea, caracterizada por la omnipresencia de la tecnología y la creciente influencia de la digitalización en todos los aspectos de la vida, la alfabetización digital se ha convertido en un imperativo ineludible. Los estudiantes universitarios, como parte de la generación que ha crecido inmersa en el mundo digital, se encuentran en el epicentro de esta transformación, por lo que la cultura digital en estudiantes universitarios representa un conjunto de actitudes, valores, conocimientos y prácticas relacionadas con el uso de la tecnología en la vida cotidiana y académica. Objetivo: analizar la cultura de la alfabetización digital en estudiantes universitarios de la licenciatura de medicina, para ello, se siguió un estudio descriptivo, observacional y transversal. Los datos se recabaron a través de un cuestionario en Microsoft Forms aplicado a 320 estudiantes resultando que: la actitud de los alumnos en relación a las nuevas tecnologías es buena debido a que la familiaridad del empleo de estas en la vida cotidiana ha facilitado su inclusión en la educación. El empleo de las TIC representa un apoyo invaluable para los estudiantes al facilitar sus investigaciones en el ámbito científico y médico, ya que les brinda la habilidad de buscar información actualizada en estos campos y, al mismo tiempo, desarrollar habilidades en el procesamiento y gestión de datos.

Palabras clave: alfabetización digital; cultura; estudiantes; universitarios

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INTRODUCTION

In current society, it can be clearly observed the deep impact of the Information and Communication Technologies (ICT) (Flores, Ortega & Sousa, 2021), the knowledge management and the increasing trend towards globalization; this factors had a significative influence on people, as they contribute to close the digital divide and offer opportunities to develop abilities and knowledge (Barrios & García, 2022). This has generated an increasing need of what is known as digital convergence, where technological innovations are becoming more and more integrated in our daily life through a wide range of products and services, including the education, that has become an integral part of this transformation and development processes (Reyes & Avello, 2021) The incorporation of ICT on the educational field provides the opportunity to take advantage of the benefits of this technologies to improve the quality an accessibility for educational processes, promoting an interactive and nurturing approach for learning, through the use of digital resources (Cueva et al., 2023).

In today´s society, digital literacy has become essential for the workplace and everyday activities of people; however, research made by Schofield et. al. (2023), emphasize that technological know-how is not a generalized thing. In this context, approximately half of the population lacks the necessary skills to use ICT, even if they had university education; besides, disparities are observed in the level of technological empowerment between different genres (Herrera & Rivera, 2020); hence, the authors argue the importance to achieving a complete digital competence, that encompasses all aspects of literacy, including digital and technological. This does not only imply knowing how to use technology, but also understanding and critically apply information, as well as effectively benefiting from the available digital tools and technologies (Cruz et al., 2023).

DIGITAL LITERACY

The digital literacy is a concept of great relevance in current society, than encompasses the ability to perform actions in a cybernetic environment, such as looking for, research and analyze information using technology; it also implies the capacity to develop abilities to create and enhance content in virtual contexts (Amaua et al., 2023); is not just a matter of using technology as a communication media, but also to understand that it represents a new form to interact, communicate, create and understand information in the digital environment (Castro et al., 2021). The digital literacy includes a skills set that allows people to interact in an effective and responsible manner with the ICT, by taking advantage of their benefits and facing the challenges they bring, becoming increasingly crucial in a world where technology and information are fundamental elements in our daily lives (Reyes & Avello, 2021).

Nowadays, society is immersed in the digital era, in which information and learning are fundamental (Marimon et. al., 2022). In this context, information management acquires a critical importance, as it involves the accurate and appropriate selection of what is relevant and necessary, thereby strengthening the skills, competences, contexts and meanings that

encompass the complexities of this technological era (Parra & Balanza, 2020) It is essential to acknowledge that the precise definition of the scope of digital literacy still requires further clarification, since digital can cover either a tool, a technique or a service with different properties and characteristics (Barbieri & Blanco, 2020) In the current context of the information society, addressing the complexities of the digital environment demands a wide and complete concept of literacy that is not reduced to specific skills or to a specific technology or set of technologies (Espeja & Lazaro, 2022); it is crucial to consider all the forms of literacy based in abilities, but also to go beyond them, covering the whole picture of digital literacy in all its dimensions; this implies an integral understanding of the competences and necessary capacities to actively browse and participate in today´s digital society (Gil, 2023).

According to Toledo (2022), the digital literacy encompasses several levels, ranging from basic skills such as posting on Instagram, to an intermediate level that implies the use of technology to enhance the daily life and increase the efficiency, up to an advanced level that requires the capacity to create original digital content. Digital literacy provides a series of meaningful benefits, including the development of critical thinking that enriches education and improves the quality of the information available, contributing as well to the enhancement of abilities and to the daily use of technology, which translates into a better quality of life. In addition, the digital literacy may open doors to better job opportunities, with perspectives and more favorable salaries; however, it is essential to take into account the digital gap manifested due to disparities in educational, social, economic and cultural environments, from a national to a global level (Reyes & Avello, 2021).

According to Guajala et al. (2021), digital literacy has as its purpose to offer education and evaluate contents, while developing basic computer skills, allowing people to use computer tools in their daily lives and creating new opportunities, socially and economically, for them, their families, and their communities. As a result, digital literacy becomes of crucial importance, as it promotes inclusion and is closely related to the digital divide, also known as the social gap, since both influence each other, thus emerging as the key to progress in the information and knowledge society. (Social, 2022).

According to Oberländer, Beinicke & Bipp (2020), there are several definitions of the concept for digital literacy; for instance, it implies the capacity to carry out successful digital actions in various life situations, including work, learning and other everyday aspects; it varies according to the individual situation of each person, and is a process that develops and evolves as the mastery of digital skills progresses; it is a broader term than ICT literacy, since it includes elements related to general literacy, such as informational, media and visual literacy; it implies the acquisition and use of personal knowledge, techniques, attitudes and skills, and includes the capacity to plan, execute and evaluate digital actions in the resolution of daily

tasks, as well as the capacity to reflect on the development of their own digital literacy.

In accordance with the previous proposition, the definition of digital literacy can be summarized as: "Knowledge, attitude and skills of individuals to use in a proper manner the digital tools, as well as the capacity to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources." It also involves the construction of new knowledge, the creation of media expressions and the communication with others in specific contexts of life, with the objective of facilitate constructive social action and reflect on this process" (Oberländer, Beinicke & Bipp, p. 135). Digital literacy encompasses all forms of literacy needed in the 21st century society due to its multifunctionality and scope, hence its nature has led to specify its implicit dimensions, broadening its meaning in a cross-sectional manner (Montenegro, Raya & Navaridas, 2020).

METHODS, TECHNIQUES, AND INSTRUMENTS

The research was descriptive, observational, and cross-sectional, conducted at the Tampico School of Medicine "Dr. Alberto Romo Caballero," from the Universidad Autónoma de Tamaulipas. Its population is composed of 1,240 students for the Physician-Surgeon bachelor's degree, during the January-May of 2023 school term, distributed from the first to tenth semester, according to the information provided by the Academic Secretariat of this institution. As for the selection of the sample, 320 students (26%) were randomly selected and voluntarily accepted to participate; data collection was carried out through a survey elaborated in Microsoft Forms, composed of 17 items that included gender and grade point average, and 15 multiple choice items that were answered anonymously with a time limit of 30 minutes.

The reliability and validity of the instrument was obtained through the analysis carried out by 5 experts in technology and innovation in ICT from the education area; reliability was determined with the application of a pilot sample to 100 students (approximately 30% of the participants in the study) and applying Cronbach alpha coefficient, which yielded a high reliability range, from 0.93 to 0.97 for the 15 questions included in the survey, and an overall value of 0.95 for the instrument; the results obtained indicated that the elimination of any of the items was not significant, hence the survey was fully implemented to the study group.

In order to analyze the collected information, the results were downloaded to a database and processed with statistic software SPSS (Statical Package for the Social Sciences) version 22; they were interpreted by means of descriptive statistics with central tendency measures and percentages.

RESULTS AND DISCUSSION

The gender distribution of respondents was of 162 women (50.46%) and 158 men (49.54%).

Technology Availability

Most of the surveyed students have a laptop and/or smartphone, and the percentage to access internet through computer or phone is considerably high, reaching 94.68% (see table 1) This data is similar to the research carried out by Hidalgo et al. (2019), which informed that 96.8% of the surveyed students in the bachelor degree in medicine, have access to internet. Also, in both studies, personal computers were highlighted as the most used device by students, representing 82.9% in the study by Hidalgo et al. (2019) and 90.62% in this study. These results also closely match the findings of Carrillo et al. (2021), who reported an Internet access rate of 92.3%.

Table 1. *Available ICT for educational activities.*

Technological support	Frequency	Percentage
Internet (computadora, teléfono)	303	94.68%
Computadora portátil	290	90.62%
Smartphone	261	81.87%
Tableta	161	50.31%
Computadora de escritorio	115	35.93%
Smart TV	108	34.06%

The grade point obtained was 8.38, with a range going between 7.7 and 9.30 (table 2) All the students that obtained grades of 9 or higher (n=12) have essential resources such as a laptop, a smartphone and internet access, providing them with wide connectivity capabilities. Among the students whose grades were in the range of 8 to 8.99 (n=287), that make up the majority of respondents, 90.8% have a laptop or smartphone; this suggests that connectivity is not a challenge for the students when it comes to accessing information, and no direct association was observed between this variable and the grades obtained.

Table 2. *Student grade points average.*

Rating grade	Frequency	Percentage
9 o mayor	12	3.75%
8 a 8.99	287	89.69%
7 a 7.99	21	6.56%
Total	161	100%

Education, time, and use of technology

Medical students who participated in the survey spend an average of 4 to 7 hours per day performing general educational activities; while the time dedicated to educational activities that involve ICTs, ranges from 2 to 4 hours per day. However, its important to highlight that 77% of the interviewed reported that they perform simultaneous activities while studying with ITC. The most common activities include the use of Facebook, real time internet conversations (chatrooms), as well as watching television, accounting for 51.40%, 32.10% and 21.10% (figure 1). This findings are consistent with the results of Hernández, Sánchez and Giménez (2021), who found that 59.0% of young people spend between 1 to 4 hours a day using ICT, in these time, the 43.0% is used to search for information, these results being similar to those obtained in this research. In addition, according to Santana et al. (2019), the most common communication activities between students include chatting, sending, or

receiving e-mails, and accessing Facebook or Hi5 with 37.0%..

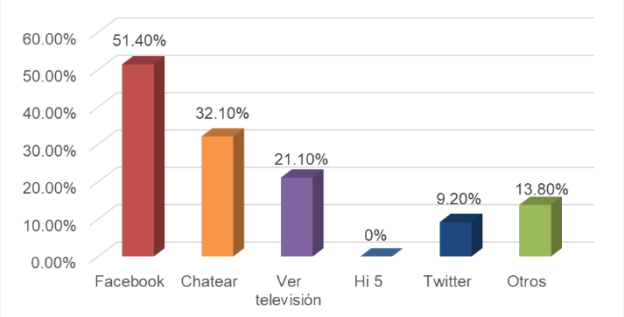

Figure 1. *Activities conducted simultaneously while studvina usina ICT.*

Education through the use of ICT

Regarding online education, 28.7% of students mentioned that they don't participate in blogs or discussion forums, 72.1% had assisted to video conferences and an impressive 90.2% have completed some online course; these findings are consistent with the research conducted by Villavicencio et al. (2019), which agrees with this study regarding participation in blogs and discussion forums, as they reported that 81.5% of students have participated in these activities, while 75.0% have attended online conferences and 87.0% have completed online courses. When asked about their preferences regarding online courses they would like to take in, the majority expressed a preference for courses about clinical practice guidelines. (figure 2)..

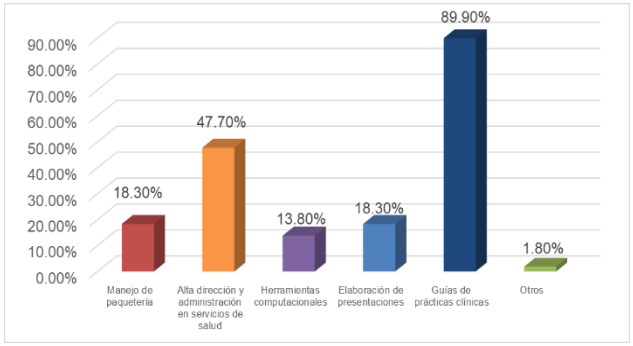

Figure 2. *Online courses you would like to take part in.*

Searches on scientific publications and the English language

The databases used by the students to access scientific medical information are detailed in table 3, and their order from most to least frequently used is: on the first place, Google Scholar, followed by Scielo and EBSCO. It is interesting to notice that, even though EBSCO is the more widely promoted database in the institution, due to its teaching program, students tend to prefer Google Scholar; these findings are in line with the results of Valladares et al. (2020), where OVID is mentioned as the most used database. Although specialized databases such as Scielo, EBSCO and OVID, offer advanced searching tools, students seem to opt for the convenience of Google Scholar.

It is important to highlight that most part of the indexed medical literature and the databases with relevant publications are published in English, as mentioned in Águila, De Oca Montano and Martínez (2023); hence, English fluency becomes a crucial factor for the integral learning of the medical students, since the search capacity for scientific

publications will be significantly limited without a good command of this language. In this study, it can be observed that the percentage of reading comprehension in non-specialized English reported by the students, ranges between 50% to 75%, results that are consistent with the findings of Fernández (2023), where it is indicate that 70% of students understand texts in general English.

Tabla 3. *Bases de datos empleadas para obtener información científica médica.*

Database	Frequency	Percentage
Google académico	247	77.18%
Scielo	158	49.37%
EBSCO	117	36.56%
Otros	47	14.68%
Science Research	44	13.75%
Microsoft Academic Research	9	2.81%

Attitudes towards new media for the acquisition of knowledge

In terms of the attitude of students towards new technologies as a mean to acquire knowledge, it is observed that the most popular preferences include reading a book (70.6%), followed by searching and reading publications on the internet (62.4%) and the option to listen a video conference (38.5%); these results are similar to those presented by Garcia, Moreno & Flores (2020), who reported a strong preference towards reading books and Internet publications. Although the familiarity with the use of ICTs in everyday life made easier its incorporation in education, the full use of these technologies in the search for medical scientific data or information for learning is yet to be achieved.

It is important to emphasize there are numerous studies about the successful application of tools in educational area, as demonstrated by the positive results obtained in the previous studies (Ayabaca, Alba & Guamán, 2019). In an study made by Largo et al. (2022), it was found that the use of ICT in their tasks, made the students show a greater interest in them, increasing their motivation, effort and persistence: the use of technology promoted creativity, divergent thinking and provided them with successful experiences, besides encouraging autonomous learning and the adaptability to different learning rates, as pointed out by Cervantes, Peña &Ramos (2020).

CONCLUSIONS

The culture of digital literacy on college students has become a critical need in this era; in an increasingly digital world, the ability to use technology effectively is not only an asset, but an essential skill for academic and professional success, as digital literacy is not limited to a mere familiarity with technological tools, but encompasses the ability to search, evaluate, and use online information in a critical and effective manner. College students who develop these skills have a significant advantage in their pursuit of knowledge and preparation for their future careers by promoting autonomy, problem solving and adaptability, skills that are highly valued in the academic and working worlds.

Ensuring that all students have access to the digital literacy culture is a key challenge, since digital gap (economic or geographic), can leave some students at a disadvantage; therefore, educational institutions and governments must strive to provide adequate resources and promote equity in access to technology and connectivity, thereby turning digital literacy into a right that should is available to everyone. As technology continues to evolve, the college students must be prepared to face challenges such as information overload, fake news proliferation and social media addiction, while, at the same time, having the opportunity to take advantage of online educational resources, collaborate globally and contribute to innovation.

Today we live in an era of interdependence, where ICTs have reduced distances and broadened access to knowledge, which translates into a reduction of the gap between researchers and available information, leading to the creation of objects and solutions aimed at improving the quality of life for the people. Therefore, it is crucial to promote and encourage the use and integration of these technologies in the academic programs of universities.

This creates a suitable environment for students to acquire skills in technological tools that are in high demand in today's work market, therefore this approach not only prepares students to face these challenges, but also contributes to close the gap between technological progress and education, allowing more individuals to benefit from the opportunities offered by ICTs; as a result, the culture of digital literacy is considered essential for the integral development of university students in the 21st Century, since it provides them with the necessary skills for academic and professional success, promotes inclusion and equity, and encourages responsibility and ethics online. As we move forward in an increasingly digital age, digital literacy becomes a fundamental pillar of higher education and the preparation for life in modern society.

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