

Appropriation of Technological Resources in the Training Practice of Nursing Students: Experience of the Popular University of Cesar

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ABSTRACT:

In recent years, especially after the pandemic in 2019, the rapid advancement of technology has transformed the way we live, work, study, and interact. Tools such as artificial intelligence, technology, robotics, and full-scale digital transformation have ceased to be futuristic promises and have become active components of our environment. These shifts have not gone unnoticed in the field of education—least of all in the health sciences, particularly in nursing—where significant transformations are beginning to emerge in both academic training and professional practice. This new landscape invites us to reflect on how these innovations are shaping the role of human resources in healthcare and redefining nursing care dynamics.

This project aimed to analyze how students in the Nursing program at the Universidad Popular del Cesar incorporate and utilize the technological tools provided by the institution as part of their educational practices. The study encompassed students from early training levels—starting in the second semester—through the most advanced stages of the curriculum, corresponding to the ninth semester. The goal was not only to identify the types of technologies used, but also to understand the contexts in which they are applied, the degree of student adoption, and how these tools contribute to the development of

their clinical, research, and ethical-humanistic competencies. This analysis revealed the role digital resources play in strengthening the teaching-learning process in real healthcare settings, as well as the challenges and opportunities that arise from integrating technology into practical nursing education.

Keywords: Digital Transformation, Educational Technology, Clinical Practice, Nursing Students

I. INTRODUCTION

Today, nursing students face an academic background that is deeply influenced by technological advances. We are in an era in which artificial intelligence, technology, robotics, high-fidelity simulation and digital educational platforms are no longer isolated elements of the Health Sciences, but are an active part of training and care processes in clinical spaces and in areas of health promotion and maintenance. What once seemed distant or exclusive to other disciplines, especially engineering, is now a palpable reality in hospitals, virtual classrooms and clinical simulation laboratories. This technological transformation has opened up a range of opportunities to optimize learning, strengthen clinical skills, and expand access to knowledge. However, it also raises ethical and pedagogical questions that cannot be ignored.

The use of digital platforms, high-fidelity simulators, mobile applications, software and automated systems has facilitated learning, made certain processes more dynamic and even improved access to information. However, it has also raised certain questions, for example, how much can technology help without putting at risk the human component that is so essential in care? Are we preparing students to use these tools judiciously?

At this point, it is essential that as teachers and professionals we stop to think about what type of nurses we are training. Because it's not just about learning how to use a tool or follow a digital protocol. It is also about learning to listen, to look at the patient with empathy, to make decisions with sensitivity and responsibility. Technology can support all of that, but it should never replace it.

Based on these concerns, this paper presents the results of a project developed with students of the Nursing program of the Popular University of Cesar. The objective was to know how they are using the technological tools available in the institution during their training practices, from second to ninth semester. Beyond the technical use, we were interested in understanding how they perceive these tools, how they integrate them into their care experiences, and what challenges they face in this process. This view allowed us to open a necessary conversation about the role of technology in training, without losing sight of the most important thing: the human being who cares and the human being who needs care, that is, that under no circumstances should it be possible to lose sight of the fact that the human being continues to be at the center of health care.

II. METHODOLOGY

For this research, a quantitative, descriptive approach was used, with a cross-sectional section corresponding to the academic period 2025-1. The study population were students in training practices of the Nursing program of the Popular University of Cesar who freely agreed to participate in the research, with a total of 285 participants, since 9 of them decided to voluntarily withdraw from the study, which was respected as part of the ethical principle of autonomy. For the instrument, which was designed for this research, all the information reviewed in the current literature was contemplated, applying the questions through a Microsoft digital form, which were shared digitally with the students, who had an estimated time of one week to carry out the voluntary completion.

The information obtained from the population under study was processed through a database in Excel Software, once all the information was coded, the analysis of the results obtained was carried out to reach the respective conclusions of the research work. The analysis of the results was carried out according to the intervened variables, contrasting with the documents reviewed in the reference framework, and then presented in tables or graphs where percentage and frequency distribution terms were detailed.

One of the relevant aspects in the process was the incorporation of the use of artificial intelligence tools to support the analysis and organization of data. Artificial Intelligence made it possible to optimize times in the interpretation of information, identify relevant patterns and suggest clear and accessible ways to present the findings. In this way, rather than replacing research work, artificial intelligence functioned as a support resource that enhanced methodological rigor and contributed to the construction of more precise and understandable conclusions.

In this sense, the research not only collected valuable information from students in training practices, but also integrated technological innovations that enriched the research process, showing how artificial intelligence can become a strategic ally in research in health sciences and in the academic training of future nursing professionals.

Likewise, the ethical aspects of this research were taken from Resolution 08430 of 1993 (Ministry of Health of Colombia, 1993) which establishes the scientific, technical and administrative standards for health research. Taking into account that the human being is the subject of study, the criterion of respect for their dignity, the protection of their rights and their well-being prevailed, that is, the information was handled in a confidential and discreet manner, guaranteeing that the participants kept their identity in complete reserve, ensuring that their personal information was not revealed, nor did it use it in other research without any consent. The data presented are carefully manifested for

academic purposes, without harmful pretensions towards the personnel and/or institution under study, without any other intention than to improve current procedures and encourage research production within our academic program.

III.RESULTS AND DISCUSSION

The project identified that the students of the nursing program of the Popular University of Cesar make active use during their training practices, of the various technological tools available in the Program and in the Institution, from the second to the ninth academic semester.

In relation to the personal profile of the participant, it was observed that most of the students are in the age range of youth (19-26 years), representing 70.2% of the sample; followed by adolescence (12-18 years) with 20.7% and finally in adulthood (27-50 years) comprising 9.1% of the respondents, reflecting a mostly young profile within the Unicesar nursing students. Regarding biological sex, female sex predominated with 84.9%, consistent with Colombian nursing statistics, where around 80% of human talent in health are women and specifically in nursing, they represent 87% of the workforce (Ministry of Health and Social Protection of Colombia, 2022); while, globally, the World Health Organization -WHO- reported that around 85% of nursing personnel are women. (WHO, 2023). Regarding gender identity, 84.9% identified as female, 14.7% as male, and 0.4% reported a different category, thus showing some diversity in this aspect within the population under study.

Regarding the academic profile of the subject of study, 57.2% are studying the old curricular plan (fifth to ninth semester), while 42.6% are going through the new curricular plan (second to fourth semester), which shows that the program updates content and learning outcomes to respond to the new demands of the health sector (Redalyc, 2018), seeking to develop in the student, competencies for comprehensive care, research, public health management and respond to the specific needs of the community (Universidad de Antioquia, 2020).; (Borré, et. al.,

2016). As for the subjects studied, the distribution shows diversity in fundamental areas for nursing: Fundamentals of Care (7.0%), Interculturality (14.4%), Basic Care (9.5%), Mental Health (12.6%), Medical Surgery (6.3%), Maternal and Child Medicine (8.1%), Internal Medicine (14.4%), Health Education (1.4%) and Health Management (13.7%). The coexistence of old and new levels of education reflects the

curricular updating processes regulated by the Ministry of National Education, which guide universities towards standardization and quality accreditations, promoting the inclusion of emerging issues such as interculturality, health technologies and the management of health services (Universidad de Antioquia, 2020; Borré, et. al, 2016).

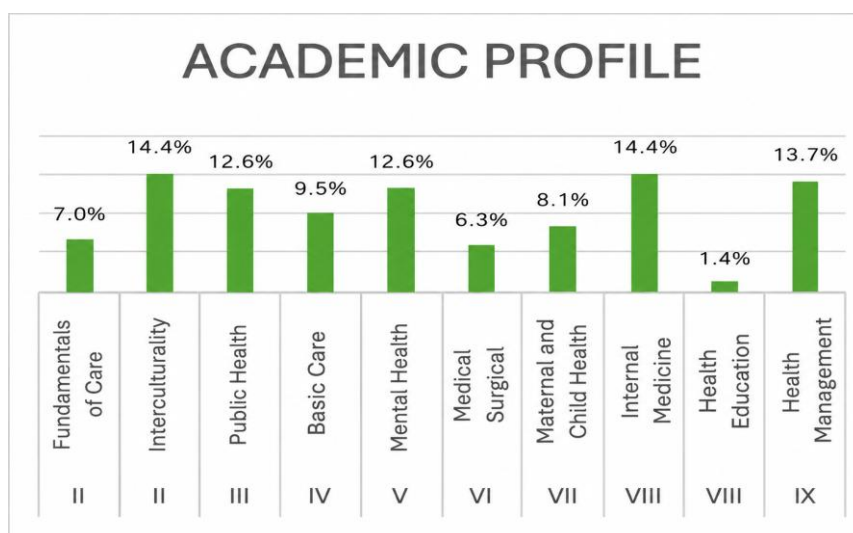


Fig.1 Academic Profile

On the other hand, to address the use of technology in students, it was organized into 3 categories:



Fig.2 Categories of Digital Platforms

🌐 Use of institutional platforms in training practices: Considering that the Popular University of Cesar uses the Microsoft digital service for the entire university community, 99.3% of students use institutional mail to

manage information and deliver activities, with 85.6% being frequent or very frequent users of this tool. 83.5% upload information to OneDrive, although only 63.8% use it frequently or very frequently. Participation in virtual

meetings by Teams reaches 98.2% of students, with 57.8% who attend frequently or very frequently. Use of the Web Classroom, which is a pedagogical and technological resource that seeks to strengthen educational management in its mission context (<https://aulaweb.unicesar.edu.co/>), with 96.8% of students using it regularly to support their study during internships, and 68.8% doing so frequently or very frequently. For information search, most students prefer Google Scholar (61.4%), followed by scientific journals and the virtual library offered by the University. These data reflect the solid integration of digital technologies in nursing education, facilitating academic management and remote communication, aligning with national and international trends in virtual education (Salas-Pilco et al., 2021; Gutiérrez et al., 2020; OECD, 2020).

 **Use of the Nursing Program's own platforms:** Considering the alternatives available from the Program, 86.3% register information by QR code on the List of Users Attended, showing high commitment to the clinical documentation that responds to patient care statistics during the internships. Regarding the use of the SIPAE software, which is an academic tool that helps nursing students to dynamize and optimize Nursing Care Processes, designed by the program's professor, Silenis Escobar, (<https://sipae.unicesar.edu.co/>), it is possible to affirm that its use is lower (35.1%), probably due to issues of access or curricular integration. as Arroyo (2020) points out. In addition, 94.7% of the students in practice complete the self-evaluation forms of the Teaching-Service Relationship required at the end of their internship. These data reflect the digitalization of learning and clinical management in nursing, in line with national trends.

 **Use of personal platforms:** The results showed WhatsApp as the most used application, with 79.3% of students using it frequently or very frequently, reflecting its fundamental role in daily and academic communication, coinciding with the majority of university students nationwide who use WhatsApp as a main tool for communication and organization of academic

activities (Paredes et al., 2018; Hernández et al., 2020). As for social networks (Instagram, Facebook, TikTok, among others), the majority (77.5%) use them in their personal time, while only approximately 20% use them during their academic day, either occasionally or systematically. This indicates a mostly recreational use outside of formal study hours, although some students integrate these platforms as support in their practices (Castillo et al., 2020). Regarding chatbots, ChatGPT is the majority preference (51.6%), followed by Gemini and others, although more than half use it infrequently. This reflects an emerging incorporation of these tools into the academic experience, which is still in the process of consolidation. For its part, in presentation design, Canva is the preferred tool almost unanimously (95.8%), with 92.6% using it frequently or very frequently, highlighting its popularity for its ease and versatility. These results show how students connect their academic lives with personal digital platforms, favoring communication, design, and technological support in their studies, in line with current trends in digital education (Paredes et al., 2018; Castillo et al., 2020).

Another important point within the research was related to the perception that nursing students have about the use of technological tools during their training practices (second to ninth semester), where although they recognize the benefits in efficiency and precision of the use of technology, they agree that their most significant experience continues to be direct contact with the patient. a perception reinforced by the teachers of practice who emphasize the humanization of care. In addition to this, the data reveal that most nursing students consider themselves at an intermediate level of management of digital tools, with 48.4%, followed by 40.4% who are at the basic level. Only 9.5% perceive themselves as having an advanced level, while the group of digital illiterate people is very small, representing 1.8%. This distribution is consistent with previous studies that show that, although the adoption and availability of technology has grown, the development of advanced skills still represents a challenge for students in health

sciences (Aranda et al., 2022; WHO, 2023). A clear majority of students (94.7%) recognize that ICTs are useful and supportive tools during their training practices, highlighting the value they assign to these technologies to facilitate learning and the execution of clinical work (Salas-Pilco et al., 2021; Moreno et al., 2020).

In addition, 80% of students consider that the scenarios where they carry out their internships do incorporate technologies, although 20% perceive limitations in the access or use of technological devices in the field. This data reflects a progressive, but still incomplete,

technological integration in practical environments, aligning with national reports on the implementation of technology in health and practical education (Ministry of Health Colombia, 2022). Finally, 92.3% positively value the appropriate use of technological tools by the practice teachers of the nursing program, indicating confidence in their teachers to provide updated training that incorporates digital resources. This teaching support is key to strengthening digital literacy and the effective adoption of technologies in clinical learning (Rodríguez & Pérez, 2021).

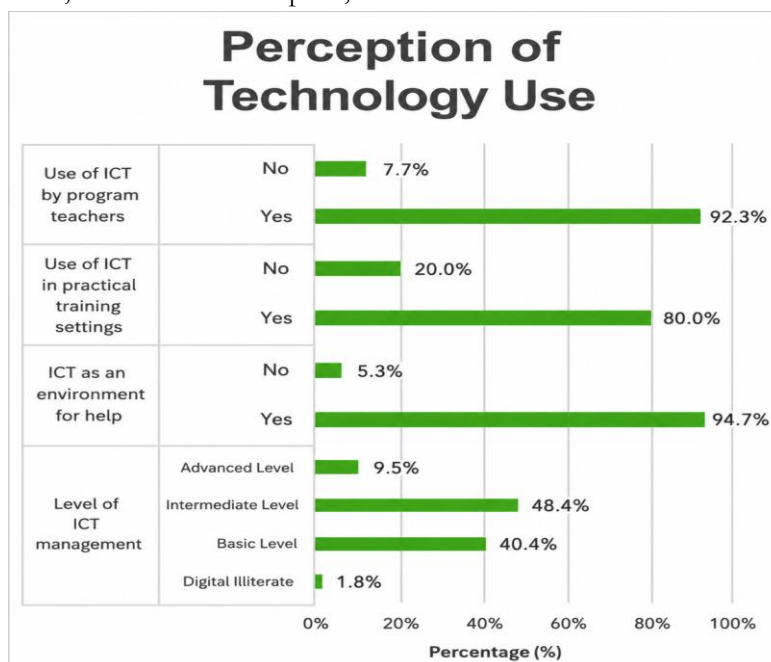


Fig.3. Perception of technology use

III.CONCLUSIONS

This project showed that the students of the Nursing program of the Popular University of Cesar are progressively and consciously incorporating the use of the technological tools available in the institution and program, especially in the development of their training practices from the second to the ninth semester.

While these technologies available to students have been useful in supporting learning and strengthening some skills, they have never replaced direct care or contact with patients. Thanks to the direct and constant accompaniment of the practice professors of the Nursing program of the Popular University of

Cesar, a strong emphasis is maintained on the importance of humanization in care, which has led students to see technology as a support, but not as a replacement for humane treatment.

In conclusion, nursing training practice can and should integrate technology as a tool at the service of care, as long as an ethical and humanized basis is maintained that allows the student to develop a critical, conscious and committed judgment with the dignity of the patient and their family. This balance between the technological and the human is undoubtedly the way to train competent, sensitive professionals who are prepared for the challenges of care today and in the future.

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