

## Digital Skills in Entrants to the Bachelor's Degree in Nursing

### Competencias digitales en los ingresantes a la carrera de Licenciatura en Enfermería

### Competências digitais em calouros do curso de bacharelado em enfermagem

*Sara Leonor Mercado*<sup>1</sup>, ORCID 0000-0003-2240-8624  
*Marisa Alejandra Zapata*<sup>2</sup>, ORCID 0000-0002-5887-7126  
*María Belén Bellando*<sup>3</sup>, ORCID 0009-0000-0554-4478  
*Carlos Jesús Canova-Barrios*<sup>4</sup>, ORCID 0000-0003-3901-6117

<sup>1 2 3</sup>Universidad Nacional del Sur

<sup>4</sup>Universidad Nacional del Oeste

**Abstract:** Objective: To determine the skills and knowledge about information and communication technologies (ICT) of entrants to the Bachelor's Degree in Nursing at a public higher institution in Bahía Blanca, Province of Buenos Aires, Argentina. Methodology: Observational, descriptive, transversal and quantitative study. An instrument was implemented consisting of 59 questions with closed response options aimed at assessing digital competencies in those entering the career. Results: 386 entrants participated, mostly female (85.49 %), from the first cycle (74.35 %) and 20 years old or younger (47.15%). 98.19 % had access to the internet, 79.27 % have a computer and more than 80 % have extensive use of social networks (WhatsApp, Instagram) and email. The entrants evaluated themselves as competent in the MS Word program, while in MS Excel they declared themselves less competent. There is a lack of knowledge and low development of skills to generate content and a wide range of skills to search and download information from the web. Age, gender, daily time of Internet use and entry cycle showed a relationship with the mastery of digital tools applied to education. Conclusions: An intermediate development of digital competencies applied to education was identified, and a high one for the use of social networks. The variables age, gender, daily time of Internet use and entry cycle were related to the knowledge and skills for using ICT applied to education.

**Keywords:** nursing students; nursing education; computer literacy; digital technology.

**Resumen:** Objetivo: Determinar las habilidades y conocimientos sobre las tecnologías de la información y la comunicación (TIC) de los ingresantes a la carrera de Licenciatura en Enfermería de una institución superior pública de Bahía Blanca, Provincia de Buenos Aires, Argentina. Metodología: Estudio observacional, descriptivo, transversal y cuantitativo. Se implementó un instrumento conformado por 59 preguntas con opciones de respuesta cerrada orientado a valorar las competencias digitales en los ingresantes a la carrera. Resultados: Participaron 386 ingresantes, mayormente de género femenino (85.49 %), del primer ciclo (74.35 %) y con 20 años o menos de edad (47.15 %). El 98.19 % tenía acceso a internet, el 79.27 % tiene computadora y más del 80 % tiene un amplio uso de redes sociales (WhatsApp, Instagram) y correo electrónico. Los ingresantes se autoevaluaron competentes en el programa MS Word, mientras que en MS Excel se declararon menos competentes. Hay desconocimiento y bajo desarrollo de habilidades para generar contenido, y un amplio

despliegue de habilidades para buscar y descargar información de la web. La edad, el género, el tiempo diario de uso de internet y el ciclo de ingreso mostraron relación con el dominio de las herramientas digitales aplicadas a la educación. Conclusiones: Se identificó un desarrollo intermedio de competencias digitales aplicadas a la educación, lo que podría ameritar el diseño de programas que nivelen estas habilidades durante el proceso de ingreso o durante la formación.

**Palabras clave:** estudiantes de enfermería; educación en enfermería; alfabetización digital; tecnología digital.

**Resumo:** Objetivo: determinar habilidades e conhecimentos sobre as tecnologias da informação e comunicação (TIC) dos calouros no curso de bacharelado em enfermagem em uma instituição pública de ensino superior na cidade de Bahía Blanca, província de Buenos Aires, Argentina. Metodologia: estudo observacional, descritivo, transversal e quantitativo. Foi utilizado um instrumento composto por 59 perguntas com opções de resposta fechada para avaliar as competências digitais dos calouros do curso. Resultados: Participaram 386 estudantes, em sua maioria do gênero feminino (85,49 %), do primeiro ciclo estudantil (74,35 %) e com idade igual ou inferior a 20 anos (47,15 %). 98,19 % tinham acesso à internet, 79,27 % tinham computador e mais de 80 % usavam amplamente as redes sociais (WhatsApp, Instagram) e o e-mail. Os calouros se auto-avaliaram competentes no programa MS Word, enquanto no MS Excel se declararam menos competentes. Há desconhecimento e baixo desenvolvimento de habilidades para gerar conteúdo e uma ampla demonstração de habilidades para pesquisar e baixar informações da web. A idade, o gênero, o tempo diário de uso da Internet e o ciclo de ingresso estudantil mostraram relação com o domínio das ferramentas digitais aplicadas à educação. Conclusões: Foi identificado um desenvolvimento intermediário de competências digitais aplicadas à educação, o que poderia demandar a concepção de programas que nivelem essas competências durante o processo de admissão ou durante a formação.

**Palavras-chave:** estudantes de enfermagem; educação em enfermagem; alfabetização digital; tecnologia digital.

Received: 04/02/2024

Accepted: 07/22/2024

How to cite:

Mercado SL, Zapata MA, Bellando MB, Canova-Barrios CJ. Digital Skills in Entrants to the Bachelor's Degree in Nursing. Enfermería: Cuidados Humanizados. 2024;13(2):e3999. doi: 10.22235/ech.v13i2.3999

---

Correspondence: Carlos Jesús Canova-Barrios. E-mail: carlos.canova1993@gmail.com

## Introduction

COVID-19, a disease caused by SARS-CoV2 infection, caused a disruption in traditional teaching formats at the higher level, especially in Health Sciences careers, historically developed in face-to-face format, leading to an abrupt implementation of training modalities mediated by Information and Communication Technologies (ICT).<sup>(1, 2)</sup>

Given the implementation of hybrid and remote modalities during training, it was essential that entrants and students have adequate management of different technological tools such as the use of virtual platforms, computer programs and tools for collaborative work, to mention a few. However, low competence has been reported for the management of these tools, <sup>(3)</sup> understanding competence as the combination of knowledge, skills and attitudes, in this case related to the use of ICT. <sup>(4, 5)</sup> Although the COVID-19 pandemic is behind us, many of the measures implemented, such as the inclusion of digital tools in teaching, prevail to this day. <sup>(6-8)</sup>

The incorporation of ICT represented a challenge for teachers, management staff and students, <sup>(8)</sup> which not only reached the higher level but also elementary and high school education. Therefore, it is expected that those entering the university system come with experience in technology-mediated education as a result of their training during the period 2020-2022, and this could also be related to the emergence of difficulties for those who are older and trained prior to this period. For this study, “entrants” students are those students who are enrolled in their first academic year at a higher education institution, whether or not they have previously attended higher education.

Recent studies carried out in Argentina in both public <sup>(9,10)</sup> and private institutions, <sup>(11)</sup> involving nursing students, revealed a high level of satisfaction with the integration of ICT in higher education, despite challenges related to internet connectivity and the lack of familiarity with certain tools, such as institutional platforms, assessment software, and appropriate device connectivity. A further study conducted in Ecuador, <sup>(3)</sup> which included participants from the Faculty of Health Sciences, revealed that the majority lacked the requisite knowledge and proficiency in ICT. This underscores the necessity for the early development of digital skills, starting from secondary school. A lack of digital proficiency is linked to suboptimal performance during training sessions <sup>(11)</sup> and an increased likelihood of abandoning the programme, <sup>(12, 13)</sup> highlighting the urgency to address this issue. <sup>(14)</sup>

Based on the above, it is recommended that research be conducted to identify strengths and weaknesses in the use of resources and information technologies in higher education. <sup>(15)</sup> The present work aims to determine the skills and knowledge about Information and Communication Technologies possessed by students entering the Bachelor's Degree in Nursing at a public higher-level institution in the city of Bahía Blanca, Province of Buenos Aires, Argentina. The information will enable the design of leveling activities to provide knowledge and skills for using digital tools to higher-level students in their first approach to the institution and before the start of the training section. This will help to reduce the risk of disintegration or academic failure due to inadequate use of the digital tools and platforms used by the institution, by focusing on the areas that have been identified as deficient.

## Methodology

An observational, descriptive, quantitative and cross-sectional study was carried out. The population was made up of 422 entrants to cycles I (first year of the study plan to obtain the training of University Nurse – undergraduate degree) and II (fourth year of the study plan to obtain complementary training to obtain the Bachelor's degree in Nursing – degree) of the Bachelor's degree in Nursing. The sample was 386 entrants, equivalent to 91.46 % of the population, chosen through a non-probabilistic sample. Those entering cycles I and II of the Bachelor's Degree in Nursing enrolled during the 2022 academic year were included, who agreed to participate voluntarily by signing the informed consent.

An instrument was implemented consisting of 59 questions with closed response options aimed at sociodemographically characterizing the sample (4 questions), evaluating secondary level experience and training (5 questions), identifying the level of access to digital devices and the Internet (6 questions), use of applications, social networks and computer programs (15 questions), evaluation of digital skills (11 questions), perception of the importance of digital tools in education (1 question) and assessment of the training experience mediated by technology during admission to the race (17 questions). The questionnaire is designed to be answered in approximately 20 minutes.

The data collection instrument was uploaded to the Google Forms software and distributed via virtual campus and email. Once the information was collected, it was exported into a Microsoft Excel database and analyzed with the Infostat v/L program.

The descriptive analysis was carried out by calculating the mean and standard deviation for the quantitative variables and absolute and relative frequencies for the categorical variables. Chi2 ( $X^2$ ) tests were implemented to evaluate the association between categorical variables and Student's T tests and ANOVA for comparison of means. A statistical significance level of  $p < 0.05$  was set.

Regarding ethical precautions, the study had the approval of the Bioethics Committee of the Dr. Leónidas Lucero Municipal Acute Hospital of Bahía Blanca, Argentina. Informed consent was obtained after data collection and participation was voluntary. This constitutes a risk-free investigation and the ethical requirements for studies in human beings expressed in the Declaration of Helsinki, Belmont Report, Personal Data Protection Law of the Argentine Republic and the standards of Good Clinical Practices were respected. <sup>(16)</sup>

## Results

The sample contained 386 entrants to the Bachelor's Degree in Nursing, who were mostly 20 years old or younger (47.15 %) and were female (85.49 %), residing in the city of Bahía Blanca (67.36 %). and entered Cycle I of the degree (74.35 %) (Table 1).

**Table 1 – Characterization of the sample**

Variable	Category	<i>n</i>	%
Age	Less than 20 years	182	47.15
	21-25 years	87	22.54
	26-30 years	40	10.36
	31-35 years	32	8.29
	36-40 years	17	4.40
	More than 40 years	28	7.25
Gender	Female	330	85.49
	Male	48	12.44
	Other	8	2.07
City of residence	White Bay	260	67.36
	Region (300 km from Bahía Blanca)	103	26.68
	Province of Buenos Aires	5	1.30
	another province	18	4.66
Revenue cycle	Cycle I	287	74.35
	Cycle II	99	25.65
<b>Total</b>		386	100.00

Most of the entrants completed their high school studies two years ago or less (52.07 %), had access to the internet during that training period (72.28 %) and activities mediated by technology (61.14 %). In those who responded that they did not have access to the Internet, they stated that they supplied it by going to libraries (10.10 %), phone shops/cyber cafes (4.40 %), consulting books and copies (5.96 %) and using mobile data (4.15 %) (Table 2).

**Table 2 – Characterization of and use of ICT during secondary education**

Variable	Category	<i>n</i>	%
Time since high school completion	0-2 years	201	52.07
	3-5 years	64	16.58
	6-8 years	29	7.51
	9 or more years	92	23.83
Internet access in high school	Yes	279	72.28
	No	107	27.72
Resources used to compensate for the lack of internet*	Library	39	10.10
	Books and copies	23	5.96
	Phone shops/Internet booths	17	4.40
	Mobile data	16	4.15
	Attendance at other places with internet	7	1.81
	Does not respond	5	1.30
I carried out activities with technology in high school	Yes	236	61.14
	No	150	38.86
<b>Total</b>		386	100.00

\* Includes only those who stated they did not have internet access.

When asked about current Internet access, entrants reported having Internet at their homes (98.19 %), logging in mostly from their laptop and desktop computers (79.27 %) and spending between four and six hours a day surfing the Internet (42.23. %), the most used website or application being WhatsApp (97.15 %), followed by email (94.30 %) (Table 3). Furthermore, it was found that 83.16 % of the entrants consider the use of ICT in training to be important.

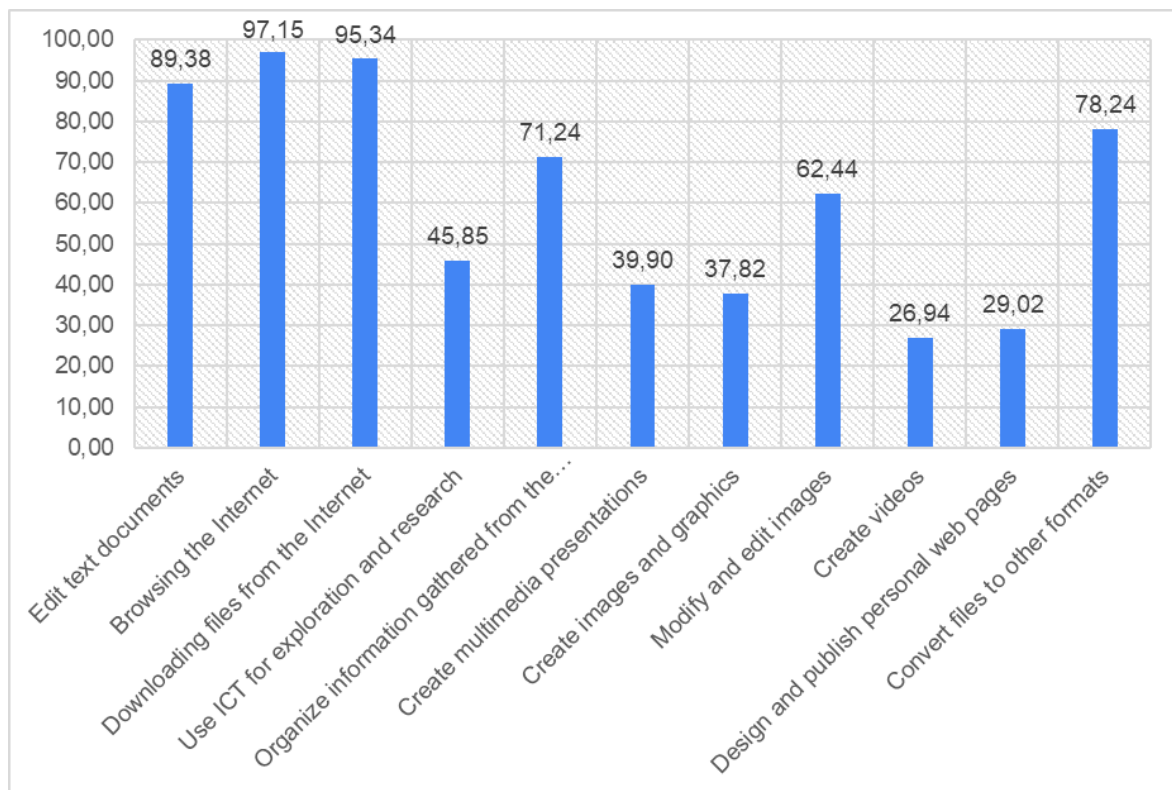
**Table 3 – Access to and use of the Internet by nursing career entrants**

Variable	Category	<i>n</i>	%
Internet access currently	Yes	379	98.19
	No	7	1.81
Resources used to compensate for the lack of internet*	Mobile data	4	1.04
	Family/neighbor internet	2	0.52
	Does not respond	1	0.26
Devices used for internet access	Computer	306	79.27
	Cell phone	281	72.80
	Tablet	18	4.66
Daily hours of dedication to the internet	1-3 hours	117	30.31
	4-6 hours	163	42.23
	More than 6 hours	106	27.46
Internet page (web) or application (App) used	WhatsApp	375	97.15
	Email	364	94.30
	Instagram	337	87.31
	Facebook	245	63.47
	Twitter	160	41.45
	YouTube	6	1.55
	Pinterest	3	0.78
	Google Meet	3	0.78
	Zoom	1	0.26
	Drive	1	0.26
Reddit	1	0.26	
<b>Total</b>		386	100.00

\* Includes only those who stated they did not have internet access.

When asked to self-assess their skills in using the tools of the Microsoft (MS) Office program on a scale from 0 (least skill) to 10 (highest skill), it was found that MS Word was the best rated with an average of 7.15 ( $SD = 2.00$ ), followed by MS PowerPoint with a mean of 5.90 ( $SD = 2.84$ ) and to a lesser extent, MS Excel with a mean of 4.12 ( $SD = 2.78$ ). When asked about the use of collaborative work applications, it was found that 88.6 % of respondents used Google Drive and 10.88 % did not use any.

The entrants were consulted about their skills to carry out various activities mediated by ICT, finding that 97.15 % reported knowing how to navigate the Internet, 95.34 % can download files from the Internet and 89.38 % perform basic text editing, in contrast, 26.94 % reported knowing how to design videos and 29.02 % knew how to design and publish personal web pages (Figure 1).



**Figure 1.** Skills to carry out ICT-mediated activities

100 % of the entrants reported using Moodle during the admission activities and the use given to the platform was to access virtual classes and take exams and questionnaires (100 %), download class files (96.37 %), reproduce videos (95.34 %) and communicate with teachers (89.38 %). When asked to evaluate the platform, 97.41 % consider it practical and useful and 95.60 % believe it is friendly and easy to use.

Regarding the use of platforms for video conferences (synchronous classes), 73.06 % of respondents mentioned using Zoom in some activities, and Google Meet (68.13 %). They also reported that Adobe Connect and Jitsi were impractical.

Regarding the institution's resources, only 16.32 % of the entrants knew the available resources of the institutional virtual library and 75.91 % stated that they had received advice for carrying out computerized administrative procedures; the remaining students obtained information from their classmates or other students (9.59 %), friends and family (1.81 %), autonomously (1.81 %), through social networks (1.55 %) and from teachers and tutors (1.30 %), among others.

When performing the inferential analysis, it was found that age ( $X^2 = 15.79$ ,  $p = 0.007$ ) and gender ( $X^2 = 4.90$ ,  $p = 0.026$ ) were shown to be related to the importance given to the use of ICT in education; in this regard, younger and female respondents considered this aspect more important.

It was identified that younger entrants had fewer skills in using MS Excel ( $p = 0.036$ ), in contrast, those of older age had greater mastery of MS Word ( $p = 0.047$ ). It was also found that male respondents had greater competence in the use of MS Excel (3.89 vs. 5.52,  $p < 0.001$ ) and MS Word (7.06 vs. 7.63,  $p = 0.034$ ), who reported spending more than six hours on the Internet per day had better proficiency in the use of MS Word ( $p = 0.004$ ) and MS PowerPoint ( $p = 0.048$ ), and those entering Cycle II had greater proficiency in the use

of MS Excel (3.90 vs. 4.75,  $p = 0.006$ ) and MS PowerPoint (5.73 vs. 6.38,  $p = 0.047$ ). Entrants who had completed high school education more than nine years ago had greater mastery of MS Excel ( $p = 0.016$ ).

Having Internet access at home was not related to the perception of competence in the use of MS Word, PowerPoint and Excel. Likewise, no relationship was found between the importance given to the use of ICT in training and the entrance cycle ( $p = 0.134$ ) nor with current access to the internet ( $p = 0.852$ ).

## Discussion

The importance for health professionals of developing digital skills is indisputable, which must be considered when planning the education curriculum.<sup>(17, 18)</sup> During and once the COVID-19 pandemic was overcome, a transformation of higher education was evident, giving greater relevance to the use of digital tools, remote training and the need to have students trained to cope with the challenges of the 21st century.<sup>(19, 20)</sup>

It is to be expected that the implementation of virtual training at the high school level of education, as well as remote work (teleworking) during the pandemic - considering that many of the entrants to the Bachelor of Nursing degree are professionally active-, would have contributed positively to the development of digital skills. However, the deficits regarding Internet access, the lack of adequate devices for the full exploration of digital tools (computer or electronic tablets) and the exclusively face-to-face dynamics of some jobs, showed a negative impact on the learning process and autonomous management of technological resources and tools.<sup>(6, 9, 10)</sup>

In Argentina, the Bachelor's degree in Nursing is divided into two cycles, the first being intended for the training of the University Nurse and the second, for complementary training to obtain the title of Bachelor of Nursing, which is why it is expected that greater digital competence will be identified in the latter as a result of their previous education.<sup>(20)</sup> This data was corroborated in the present work where those entering cycle II reported better handling of MS Excel and PowerPoint.

Likewise, age was shown to be linked to the level of development of digital skills. Although it was expected to identify more competencies linked to this area in younger students, as a result of greater exposure to technology, it is described that this is only related to greater use of social networks, but not with collaborative work tools and text editing programs, data management or presentation design such as those of the MS Office package.<sup>(21)</sup> This data could also be related to the frequent and obligatory use of these tools in workspaces, explaining the associations between competence in the second cycle of edition.

The study revealed a high level of proficiency in competencies related to browsing and downloading documents from the Internet, editing text documents, and converting file formats. Conversely, video design and web page design and publication were identified as areas with the lowest level of development. These findings align with the observations of multiple authors who have noted that students and new entrants tend to lack the necessary skills to create content.<sup>(22-25)</sup>

Regarding the association between the male gender and higher levels of competence for the use of computer programs such as MS Excel and Word, a study carried out by Cabezas González et al.<sup>(26)</sup> found, in a sample of 70 students, better knowledge and management of technological resources in male students. In this work, a positive attitude towards ICT was also identified, evidenced in the perception of these as useful and necessary



for the future professional (score 8.43 out of 10), similar to the findings of the present study where more than three quarters consider them useful. This finding is relevant because attitudes towards the development of digital skills have been linked to a greater commitment to learning them. <sup>(27)</sup>

From a practical standpoint, the findings of this study can serve as a preliminary diagnostic tool for assessing the low level of digital competencies among new students and those pursuing a Bachelor's Degree in Nursing. This information can inform the design and implementation of interventions to address this issue and reduce its impact on students' academic trajectories and potential dropout rates.

As potential limitations, we note the type of sampling employed and the use of an instrument developed ad hoc for the study, which may affect the representativeness of the sample and the comparability of the findings with those of other studies.

### **Conclusion**

Upon analysis of the level of digital competence among the incoming Bachelor of Nursing students, it was observed that they exhibited a positive self-assessment of their proficiency in the use of MS Word. In contrast, they indicated less proficiency in MS Excel. A notable deficiency in knowledge and a scarcity of skill development in content generation are apparent, while the utilization of skills for information search and download from the web is pervasive.

Furthermore, it was established that younger age groups and females ascribe greater importance to ICT in higher education. Male, older, male entrants who reported using the Internet for more than six hours per day and who were entering Cycle II demonstrated superior command of digital tools applied to education.

It can be inferred that the entrants demonstrate an intermediate level of digital competencies applied to education, with a notable proficiency in the use of social networks. It is recommended that leveling programs be implemented during the entry process or training to impart skills in the use of devices, programs, and digital tools. Furthermore, the integration of content pertaining to the advancement of computer competencies in an educational and professional context into the curriculum represents a potential avenue for consideration.

### **Bibliographical references**

1. Sánchez-Duque J. Educación médica en tiempo de pandemia: el caso de la enfermedad por coronavirus 2019 (COVID-19). *Educ Med.* 2020;21(4):259-260. doi: 10.1016/j.edumed.2020.05.005
2. Dewart G, Corcoran L, Thirsk L, Petrovic K. Nursing education in a pandemic: Academic challenges in response to Covid-19. *Nurse Educ Today.* 2020;92:104471. doi: 10.1016/j.nedt.2020.104471
3. Huamante-Ramos P, Solís-Mazón ME, Fernández-Acevedo J, Silva-Castillo J. Las competencias TIC de los estudiantes que ingresan en la universidad: una experiencia en la Facultad de Ciencias de la Salud de una universidad latinoamericana. *Educ Med.* 2019;20(3):134-139. doi: 10.1016/j.edumed.2018.02.002

4. Gonczi A. Competency-based approaches: linking theory and practice in professional education with particular reference to health education. *Educ Philos Theory*. 2013;45(12):1290-1306. doi: 10.1080/00131857.2013.763590
5. Fernández Zalazar DC, Jofre C, Fiotti J, Odeon L. Proceso de definición de las competencias digitales para su evaluación en la educación superior en estudiantes de la carrera de psicología. In XI Congreso Internacional de Investigación y Práctica Profesional en Psicología; 2019 Nov 27-29; Buenos Aires, Argentina: Ediciones de la Facultad de Psicología Universidad de Buenos Aires; 2019. p. 12-16. Available from: <https://www.academica.org/000-111/976>
6. Lepez C. La educación superior argentina en la pandemia por Covid-19 y en la pospandemia. *Salud, Ciencia y Tecnología*. 2021;1:16. doi: 10.56294/saludcyt202116
7. Rodríguez-Martínez C, Alvarez-Solano J, Pérez-Galavís AD, Ron M. Distance education during the COVID-19 pandemic: experience at a public university. *Seminars in Medical Writing and Education*. 2023;2:32. doi: 10.56294/mw202332
8. Hernández SS, Méndez PG, Sosa LR, Flores MA, Rodríguez MA, Canova-Barrios C. Percepción de los docentes de la Licenciatura en Enfermería sobre la educación a distancia durante la pandemia COVID-19. *Salud, Ciencia y Tecnología*. 2023;3:183. doi: 10.56294/saludcyt2023183
9. Canova-Barrios C, Méndez PG, Sosa LR, Flores MA, Rodríguez MA, Hernández SS. Percepción y satisfacción de estudiantes de Enfermería con la educación virtual en época de COVID-19. *Enfermería: Cuidados Humanizados*. 2023;12(2):e3304. doi: 10.22235/ech.v12i2.3304
10. Canova Barrios C, Hernández SS, Méndez PG, Sosa LR, Flores MA, Rodríguez MA. Análisis de la percepción y satisfacción de docentes y estudiantes de enfermería con la educación remota en contexto de pandemia. *Minerva*. 2023;2(7): Minerva 2(7):80-92. Available from: <https://ojs.editorialiupfa.com/index.php/minerva/article/view/133>
11. Spector CH, Figueira J, Miramontes C, Canova-Barrios C. Enseñanza y evaluación a distancia en época de pandemia: experiencia inicial de las Carreras de Salud de UCES. *Rev Arg Educ Med*. 2020;9(2):7-18. Available from: [http://dspace.uces.edu.ar:8180/jspui/bitstream/123456789/6384/1/Ense%C3%B1anza\\_Spector.pdf](http://dspace.uces.edu.ar:8180/jspui/bitstream/123456789/6384/1/Ense%C3%B1anza_Spector.pdf)
12. García Aretio L. El problema del abandono en estudios a distancia. Respuestas desde el Diálogo Didáctico Mediado. *Revista Iberoamericana de Educación a Distancia*. 2019;22(1):245-270. doi: 10.5944/ried.22.1.22433
13. Ortigoza A, Prchal A, Canova-Barrios C. Trayectorias académicas de estudiantes de la Licenciatura en Enfermería de la Universidad Nacional de Tucumán a través del análisis de indicadores de rendimiento académico. *Enf Global*. 2024;23(2):390-409. doi: 10.6018/eglobal.600331

14. Jara-Avellaneda MO, Huayta-Franco YJ, Saenz Arenas ER, Cohaila Flores JM. Motivation in virtual classrooms during COVID-19: experiences of nursing students. *Salud, Ciencia y Tecnología*. 2023;3:442. doi: 10.56294/saludcyt2023442
15. Gómez Cano CA, Sánchez Castillo V. Systematic review on Augmented Reality in health education. *Gamification and Augmented Reality*. 2023;1:28. doi: 10.56294/gr202328
16. Canova Barrios CJ. Ethical aspects in the publication of scientific manuscripts: A literature review. *Salud, Ciencia y Tecnología*. 2022;2:81. doi: 10.56294/saludcyt202281
17. Khurana MP, Raaschou-Pedersen DE, Kurtzhals J, Bardram JE, Ostrowski S, Bundgaard J. Digital health competencies in medical school education: a scoping review and Delphi method study. *BMC Med Educ*. 2022;22:129. doi: 10.1186/s12909-022-03163-7
18. Vásquez-Pajuelo L, Rodríguez-Barboza JR, Bartra-Rivero KR, Quintanilla-Alarcón EA, Vega-Jaime W, Chavarri-Joo F. Digital Challenges: The Need to Improve the Use of Information Technologies in Teaching. *Data and Metadata*. 2024;3:216. doi: 10.56294/dm2024216
19. Pomares Bory EJ, Vázquez Naranjo O, Barrios Herrero L, Arencibia Flores LG, Bernardo Fuentes MG. Pertinence of the teaching use of virtual classroom by Basic Biomedical Science Department. *Seminars in Medical Writing and Education*. 2023;2:31. doi: 10.56294/mw202331
20. Canova Barrios C. Modalidad virtual en la formación en Enfermería: ¿Oportunidad o amenaza?. *Rev Esp Edu Med*. 2014;5(3). doi: 10.6018/edumed.619001
21. González Bello EO. Habilidades digitales en jóvenes que ingresan a la universidad: realidades para innovar en la formación universitaria. *Revista Iberoamericana para la Investigación y el Desarrollo Educativo*. 2018;8(16). doi: 10.23913/ride.v8i16.363
22. Vázquez-Cano E, Reyes Vélez M, Colmenares Zamora L, López Meneses E. Competencia digital del alumnado de la Universidad Católica de Santiago de Guayaquil. *Opción*. 2017;33(83):229-251. Available from: <https://www.redalyc.org/journal/310/31053772008/html/>
23. González Calatayud V, Román García M, Prendes Espinosa MP. Formación en competencias digitales para estudiantes universitarios basada en el modelo DigComp. *EduTec. Revista Electrónica De Tecnología Educativa*. 2018;65:1-15. doi: 10.21556/edutec.2018.65.1119
24. Castillejos López B. Gestión de información y creación de contenido digital en el prosumidor millennial. *Apertura*. 2019;11(1):24-39. doi: 10.32870/ap.v11n1.1375
25. Marín-Marín A, Hernández-Romero MI, Borges-Ucán JL, Blanqueto-Estrada M. La competencia digital del estudiantado universitario. *Transdigital*. 2021;2(3). doi: 10.56162/transdigital48

26. Cabezas González M, Casillas Martín S, Sanches-Ferreira M, Teixeira Diogo F. ¿Condicionan el género y la edad el nivel de competencia digital? Un estudio con estudiantes universitarios. *Fonseca, Journal of Communication*. 2017;15(15):109-125. doi: 10.14201/fjc201715109125
27. Pramila-Savukoski S, Kärnä R, Kuivila HM, Juntunen J, Koskenranta M, Oikarainen A, et al. The influence of digital learning on health sciences students' competence development. A qualitative study. *Nurse Educ Today*. 2023;120:105635. doi: 10.1016/j.nedt.2022.105635

**Funding:** The study was funded by the Universidad Nacional del Sur (UNS), Bahía Blanca, Province of Buenos Aires, Argentina.

**Data availability:** The dataset supporting the results of this study is not available.

**Authors' contribution (CRediT Taxonomy):** 1. Conceptualization; 2. Data curation; 3. Formal Analysis; 4. Funding acquisition; 5. Investigation; 6. Methodology; 7. Project administration; 8. Resources; 9. Software; 10. Supervision; 11. Validation; 12. Visualization; 13. Writing: original draft; 14. Writing: review & editing.

S. L. M. has contributed in 1, 2, 3, 4, 5, 6, 7, 8, 10, 13, 14; M. A. Z. in 1, 5, 6, 8, 11, 13, 14; M. B. B. in 1, 5, 6, 8, 11, 13, 14; C. C. B. in 1, 2, 3, 6, 8, 9, 11, 12, 13, 14.

**Scientific editor in charge:** Dra. Natalie Figueredo.