

Digital proficiency and the learning of Brazilian nursing institutions' history in the pandemic

Proficiência digital e aprendizagem da história das entidades da enfermagem brasileira na pandemia
Competencia digital y aprendizaje de la historia de las asociaciones de enfermería brasileñas durante la pandemia

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Abstract

Objective: To characterize the digital proficiency of nurse students about the history of Brazilian nursing class institutions.

Methods: Exploratory-descriptive, cross-sectional study carried out in the Nursing bachelor's degree from three campuses of a federal public higher education institution in northeastern Brazil. We applied, from November 2020 to May, a questionnaire via Google Forms to nurse students regularly registered in the second and third periods of the course. We carried out statistical, descriptive, and inferential analyses.

Results: 56 nurse students participated in the study, of which 55.64% were from campus 1; 53.6% attended the third semester, 83.9% were female; average age of 20.55 (+3.32) years old; 55.4 were brown; 94.6% with no employment relationship; 73.2% living with their parents; 92.9% with a monthly family income of three minimum wages. We considered the average degree of basic digital proficiency low. Regarding the digital technologies in teaching and the learning about the class institutions' history, 62.5% believed that it contributed to the learning process, besides the classroom space and it eased the access to content, and 78.6% considered it important to develop a critical-reflexive sense and the awareness about the participation of these institutions. They found it fundamental to know the creation history, contributions, struggles, challenges, and first directors of the Brazilian Nursing Association, besides the creation of the Nursing Federal and Regional Councils and the respective attributions.

Conclusion: The teaching-learning process mediated by digital technologies needs to consider the digital competencies and students' interest in remote teaching about the nursing class institutions' history.

Resumo

Objetivo: Caracterizar a proficiência digital e a aprendizagem de estudantes de enfermagem sobre a história das entidades de classe da enfermagem brasileira.

Métodos: Estudo exploratório-descritivo, transversal, realizado no curso de bacharelado em enfermagem, de três *campi* de uma instituição de ensino superior pública federal do Nordeste brasileiro. Aplicou-se, de novembro de 2020 a maio de 2021, questionário, via Google *Forms*, aos estudantes de enfermagem regularmente matriculados no segundo e terceiro períodos do curso. Realizou-se a análise estatística descritiva e inferencial.

Resultados: Participaram 56 estudantes de enfermagem, sendo 55,4% vinculados ao *campus* 1; 53,6% cursavam o terceiro semestre; 83,9% do sexo feminino; média idade de 20,55 (+3,32) anos; 55,4% pardos; 94,6% sem vínculo empregatício; 73,2% residindo com os pais; 92,9% com renda familiar mensal equivalente a três salários-mínimos. O grau de proficiência digital básico médio foi considerado baixo. Quanto

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às tecnologias digitais no ensino e à aprendizagem sobre história das entidades de classe, 62,5% acreditaram que contribuiria para aprendizagem, além do espaço da sala de aula, e facilitaria o acesso aos conteúdos; e 78,6% consideraram importante para desenvolver o senso crítico-reflexivo e a conscientização sobre a participação nessas entidades. Evidenciaram fundamental conhecer história da criação, contribuições, lutas, desafios e primeiras diretoras da Associação Brasileira de Enfermagem, além da criação dos Conselhos Federal e Regionais de Enfermagem e das respectivas atribuições.

Conclusão: As ações de ensino-aprendizagem, mediadas por tecnologias digitais, precisam considerar as competências digitais e os interesses dos estudantes na aprendizagem remota sobre história das entidades de classe da enfermagem.

Resumen

Objetivo: Caracterizar la competencia digital y el aprendizaje de estudiantes de enfermería sobre la historia de las asociaciones profesionales en la enfermería brasileña.

Métodos: Estudio exploratorio descriptivo, transversal, realizado en la carrera de licenciatura en enfermería, en tres *campi* de una institución de enseñanza superior pública federal del nordeste brasileño. De noviembre de 2020 a mayo de 2021, se aplicó un cuestionario por Google Forms a los estudiantes de enfermería regularmente matriculados en el segundo y tercer semestre de la carrera. Se realizó un análisis estadístico descriptivo e inferencial.

Resultados: Participaron 56 estudiantes de enfermería, el 55,4 % estaba vinculado al *campus* 1; el 53,6 % del tercer semestre; el 83,9 % de sexo femenino; promedio de edad de 20,55 (+3,32) años; el 55,4 % pardo; el 94,6 % sin vínculo laboral; el 73,2 % vive con sus padres; el 92,9 % con ingresos familiares mensuales equivalentes a tres salarios mínimos. El nivel de competencia digital básica promedio fue considerado bajo. En lo que se refiere a las tecnologías digitales en la enseñanza y al aprendizaje sobre historia de las asociaciones profesionales, el 62,5 % consideró que contribuiría para el aprendizaje, más allá del aula, y facilitaría el acceso a los contenidos; el 78,6 % lo consideró importante para desarrollar el sentido crítico-reflexivo y para concientizar sobre la participación en esas asociaciones. Consideraron fundamental conocer la historia de la creación, las contribuciones, las luchas, los desafíos y las primeras directoras de la Asociación Brasileña de Enfermería, además de la creación del Consejo Federal y los Consejos Regionales de Enfermería y sus respectivas atribuciones.

Conclusión: Las acciones de enseñanza-aprendizaje, mediadas por tecnologías digitales, deben considerar las competencias digitales y los intereses de los estudiantes en el aprendizaje remoto sobre historia de las asociaciones profesionales de enfermería.

Introduction

In Brazil, the nurse formative process requires knowledge about the class institutions such as the Brazilian Nursing Association (ABEn) and Federal and Regional Nursing Councils, considering that this service is fundamental for the comprehension of nurse professionalization. That includes the confirmation of a body of knowledge from the nursing science, professional autonomy, and self-regulation, and reveals the fight dynamics and conquests of the nursing institutions for the formation of professional identity, scientific growth, and social recognition of this category.⁽¹⁾ Hence, the importance of the collective and organized fight through its institutions permeates Brazilian nursing since the beginning of its professionalization.⁽²⁾

This identity is built over time, and in different scenarios, it is not stagnant, and, thus, it transforms in political, social, and cultural contexts. Hence, class institutions follow this modification and reinforce the professional identity through social recognition, the propriety of specific knowledge, and professional credentialism.⁽³⁾

Given the relevance of the nursing training process and put as a learning need that is contemplated as content in curricular disciplines, the his-

tory of the Brazilian nursing class institutions also faced challenges in the current pandemic context, in which several presidential activities in the global scenario were suspended and/or adapted to the remote emergency system that includes the educational. In Brazil, we replaced the presential classes with remote classes by digital means. Therefore, digital technologies became indispensable in every teaching-learning scenario from basic education to higher education. The pandemic obligated higher education institutions (HEI) to adopt teaching mediated by technology.⁽⁴⁾

Thus, teachers and students were provoked and stimulated to teach-learn through digital technologies. In this process, it is necessary to consider the technological infrastructure, the competences with software and the distinct proficiencies of teacher and students in the use of different resources, aiming to reach curricular objectives.⁽⁵⁾

Studies developed in different countries of the western and eastern point out that the process of nursing training through emergency remote teaching during the pandemic found different challenges for the realization that negatively influenced learning, among them, they cited the teachers' and students' proficiency regarding the use of software.⁽⁶⁻⁹⁾

We can understand digital proficiency in education as the individual capacity to use course management systems, resources, and interactive tools to carry out virtual education in the context of online learning.⁽⁴⁾ This comprehension is important for the conception and planning of educational activities that involve and motivate students.⁽¹⁰⁾

Hence, we justify this study by the importance of class institutions as nursing organizations in the historical processes of the political and social fight for nursing and society. Besides considering the unexpected and abrupt transition, as a result of the COVID-19 pandemic, from traditional to emergency remote teaching mediated by digital technologies, of which we could not consider individual aspects of digital competence regarding different resources and technologies used. Although the gradual return of the presential classes, we believe that the use of these technologies will remain integrated to education.

Furthermore, in Brazil, the pandemic uncovered the reality regarding the inequalities of access to information, by the lack of ability, financial resources for computers and internet, or not having access given the geographic location. Thus, there is a social issue from a continental country defined by the plurality of the population characteristics. Hence, it becomes necessary to characterize the particularities, including the digital proficiency of nurse students, which will allow planning the activities consistent with the target audience.

Given the above, the study aimed to characterize the digital proficiency and learning of nurse students about the Brazilian nursing institutions' history.

Methods

An exploratory-descriptive, cross-sectional study integrates the first methodological step from a macro project that elaborates and validates an educational app for smartphones about the nursing class institutions' history. We followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE)⁽¹¹⁾ carried out with nurs-

ing students from three campuses of a federal public higher education institution in the northeastern region of Brazil. Regarding localization, one of the campuses is in the capital of the state (campus 1), and the other two are situated 313 (campus 2) and 246 (campus 3) kilometers from the capital.

The population was composed of 210 nursing students regularly registered in the second and third periods of the Nursing bachelor's degree in one of the three campuses. We included students that attended the Nursing history discipline, and we excluded those under 18 years old and those that, during the data collection, requested to withdraw their registration. We opted, in this study, to involve only nursing students even though in the processes of teaching and learning, students and teachers are essential. Despite facing difficulties in the transition from the presential to the remote, many teachers received from their institutions the necessary support for the continuation of this process, such as the training.⁽¹²⁾

We calculated the sample size according to the sampling technique stratified by proportion, considering the 95% confidence level and sample margin of error of 5%. Because of the advent of the COVID-19 pandemic, which precluded the on-site meeting in which many had or did not have restricted access to the internet, the sample was 56 individuals. Consequently, the sampling error was 11.24% with a 95% confidence interval, which did not preclude the study.

The data collection occurred from November 2020 to May 2021. The principal researcher made the invitation to participate in the research electronically. We utilized e-mail and an instant messaging app from the nursing student groups of the second or third period.

Thus, we applied an online questionnaire via Google Forms, guided by the components of the Brazilian Institute of Geography and Statistics (IBGE) for the characterization of the socio-demographic profile composed of the variables: age, sex, race, occupation, who you live with, and family income. We evaluated the Basic Digital Proficiency (BDP) with an instrument developed in 2013 by researchers from the São Paulo state to

evaluate the level of digital proficiency being constituted by eight components, measured in scale type Liker, varying from 1 to 5. We highlight that the instrument obtained Cronbach's alpha of 0.921 in its full assessment.⁽¹³⁾ The Arithmetic mean of these components defines the BDP. For each component, we calculated the average degree of agreement.

Literature reviews carried out by the authors of this study and accepted for publication in relevant national journals for the nursing knowledge and related areas, that contemplated digital technologies in teaching history of nursing; and the class institutions and the nursing professionalization, as well as the analysis of course plans of nursing history and the pedagogical projects allowed the elaboration of two close-ended questions of the online questionnaire about the utilization of digital technologies and learning of class institutions' history. It also allowed the elaboration of items regarding the content about the class institutions that were measured in Likert-type scale, varying from 1 (not important) to 5 (indispensable). We did not submit the instrument for pre-test. We highlight that the average time of answer of the questionnaire was approximately 10 minutes.

We tabulated the quantitative data in spreadsheets of the Microsoft Excel program and transferred them to the Statistical Package for the Social Sciences (SPSS) software, version 22.0, for the statistical analysis. We described the quantitative variables by the measures of central tendency (position): average and median and by the measures of variability: standard deviation. For the qualitative variables, we utilized simple descriptive statistics: absolute and relative frequency. We present the data in tables and graphics, and we discuss them according to the reviewed literature.

The Research Ethics Committee of the Universidade Federal do Piauí approved the study. The free participation of students in the research occurred according to the Free and Informed Consent, available online (Certificate of Presentation for Ethical Appreciation: 34393020.2.0000.5214).

Results

Regarding the participants' profile, We observed a prevalence of students from campus 1, situated in the capital, 31 (55.4%) from the third period; 30 (53.6%), female sex; 47 (83.9%), with an average age of 20.55 (\pm 3.32) years old; brown 31 (55.4%); unemployed 53 (94.6%); resided with parents, father or mother, 41 (73.2%); and with a monthly family income of three minimum wages 52 (92.9%) (Table 1).

Table 1. Socio-demographic characteristics of nursing students

	n(%)	95%CI-	Average(95%CI)	Standard deviation
<i>Campi</i>				
<i>Campus 1</i>	31(55.4)	(42.3-67.8)		
<i>Campus 2</i>	9(16.1)	(8.3-27.3)		
<i>Campus 3</i>	16(28.6)	(18.0-41.3)		
<i>Period</i>				
2 nd period	26(46.4)	(33.8-59.4)		
3 rd period	30(53.6)	(40.6-66.2)		
<i>Sex</i>				
Male	9(16.1)	(8.3-27.3)		
Female	47(83.9)	(72.7-91.7)		
Age			20.55(19.66±21.44)	3.32
<i>Race/color</i>				
Black	9(16.1)	(8.3-27.3)		
White	15(26.8)	(16.6-39.3)		
Brone	31(55.4)	(42.3-67.8)		
Yellow	1(1.8)	(0.2-8.0)		
<i>Employed</i>				
No, only studies.	53(94.6)	(86.4-98.5)		
Yes	3(5.4)	(1.5-13.6)		
<i>Live with</i>				
Father or Mother	41(73.2)	(60.7-83.4)		
Grandparents	3(5.4)	(1.5-13.6)		
Friends	7(12.5)	(5.8-23.0)		
Others	5(8.9)	(3.5-18.5)		
<i>Monthly income (MW)</i>				
11-13 MW	52(92.9)	(83.9-97.5)		
4-16 MW	4(7.1)	(2.5-16.1)		

MW - minimum wage value: R\$ 1,045.00. Current year 2020, Brazil; *95%CI for the proportion; †95%CI for the average

Regarding the BDP, prevailed 21 (37.5%) always used the computer; 26 (46.4%) occasionally liked to work on the computer; 46 (82.1%) always accessed the internet; 44 (78.6%) always liked to access the internet; 24 (42.9%) occasionally verified the e-mail every day or multiple times a week; 38 (67.9%) always searched information on the internet; 27 (48.2%) occasionally read with news or other texts from the internet; 39 (69.6%) al-

ways wrote texts on Word or another word processor (Table 2).

Table 2. Components of the basic digital proficiency of nursing students.

Components of the basic digital proficiency of nursing students.	Never n(%)	Rarely n(%)	Sometimes n(%)	Occasionally n(%)	Always n(%)
Frequency of computer use	0(0.0)	5(8.9)	11(19.6)	19(33.9)	21(37.5)
Likes working on the computer	0(0.0)	5(8.9)	12(21.4)	26(46.4)	13(23.2)
Frequency of internet use	0(0.0)	0(0.0)	0(0.0)	10(17.9)	46(82.1)
Likes using the internet	0(0.0)	0(0.0)	1(1.8)	11(19.6)	44(78.6)
E-mail	1(1.8)	1(1.8)	7(12.5)	24(42.9)	23(41.1)
Online information	0(0.0)	1(1.8)	3(5.4)	14(25.0)	38(67.9)
News	0(0.0)	0(0.0)	7(12.5)	27(48.2)	22(39.3)
Use of word processor	0(0.0)	0(0.0)	3(5.4)	14(25.0)	39(69.6)

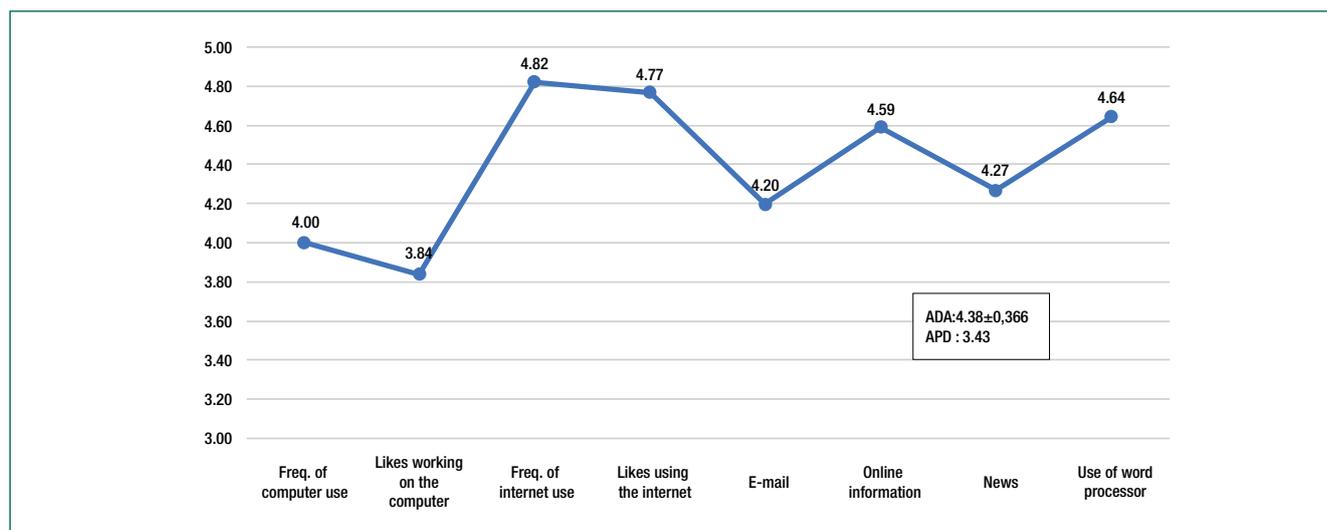
The average degree of agreement of the nursing students regarding each question from BDP obtained values that vary from 3.84 (high) to 4.82 (very high) in the eight components of the BDP evaluated (Figure 1), and overall average degree of agreement of 4.36 ($\pm 0,36$), that is, very high. The average degree of BDP was 3.43, considered low (Figure 1).

Concerning the utilization of digital technologies, 35 (62.5%) of the participants believed that it contributed to allowing learning beyond the classroom space, and 35 (62.5%) facilitated access to the content at any time and place. However, 35 (62.5%) said that it did not contribute to motivat-

ing learning, and 37 (66.1%) it would not break the traditional teaching methodology. Regarding the learning of the history of nursing class institutions, the nursing students considered it important to develop a critical-reflexive sense of nursing class institutions 44 (78.6%), as well as awareness about the participation of these institutions. They did not consider it important: 28 (67.9%) to the construction of professional identity, 47 (83.9%) to the appropriation of the institutions' history, and 35 (62.5%) to the understanding of the contributions of the nursing institutions to the nursing. Regarding the educational contents of the nursing students' interest in learning about the class institutions' history, the participants indicated the importance of the creation of the *ABEn* 32 (57.1%); the first directors of the *ABEn* 24 (42.9%); indispensable the contributions of the *ABEn* 33 (58.9%); the fights and challenges of the *ABEn* 36 (64.3%); the history of the creation of the Federal Nursing Council (*Cofen*) system and the Regional nursing Councils (*Coren*) 36 (64.3%); and the attributions of the *Cofen/ Coren* system 38 (67.9%).

Discussion

The abrupt change in the offer of nursing teaching in traditional models for the totally remote caused



ADA - Overall Average Degree of Agreement; APD GPM - Average Proficiency Degree

Figure 1. Average degree of agreement and basic digital proficiency of nursing students

nursing students the necessity of overcoming challenges to adapt themselves to this model and the digital technologies. Considering that there is not much knowledge about the preparedness of students to use digital technologies in the teaching-learning process, characterizing students that use this technology allows foresee the obstacles and plan actions to the confronting regarding its utilization, benefiting content absorption, comprehension, and apprehension by youngsters that were not familiarized with this pedagogical methodology.⁽¹⁰⁾

We observed that the sociodemographic profile of participants resembled students from higher education, as well as nursing students from other Brazilian states, being predominantly the female sex, with an average age of approximately 20 years old, brown skin, unemployed, low-income, and residing with their parents.⁽¹⁴⁻¹⁶⁾ Data from the last census of Brazilian higher education indicated that regarding the number of registered students, there was a predominance of the female sex, 21 years old, in presential courses.⁽¹⁷⁾

It is necessary to consider that nursing is a predominantly female profession, although it is notable the increasing participation of the male sex in the professional practice. The nursing profile in the Americas Region indicates that about 87% of the nursing team is composed of people from the female sex.⁽¹⁸⁾

Regarding the characterization of the BDP, that is, how truly an individual gets involved with digital technologies, informatics knowledge, use of the internet, and infinite possibilities,⁽¹³⁾ the results converged to characteristics of the generation of academics born around the 2000's year, the Net Generation, considered the digital native.⁽¹⁹⁾ This generation has technology as part of their lives and learns to learn in a way more related to heutagogy than to classical pedagogy.⁽¹⁹⁾

Despite this peculiar characteristic of this generation in which the participants of this study are framed, we considered the level of BDP presented by them low, thus, limitations regarding the use of digital technologies need to be considered in the application of remote teaching in the pandemic context. This finding corroborates a study that de-

termined that even digital native university students inserted in university with resources did not present digital competence.⁽¹⁰⁾

A study carried out in Jordan also identified the low ability of nursing students the use technologies for online learning during the pandemic.⁽⁸⁾ A study developed in Saudi Arabia considered the lack of proficiency and training in the use of educational platforms a challenge in online teaching instituted due to COVID-19.⁽⁶⁾

Hence, besides considering the digital proficiency of students in the development of remote teaching-learning actions, educational institutions have the primordial function of improving this proficiency, contributing to the enhancement of these technological abilities that will be important for learning over the professional life. They must give special attention to informatics support in nursing.⁽⁸⁾ Therefore, digital native students will not be expected to be autodidact, capable of navigating and learning by themselves without any orientation.⁽¹⁰⁾

In this perspective, a review of the scope regarding technological literacy in nursing education indicates that educational institutions need to guarantee the development of the technological competencies and abilities necessary for student success as well as professional.⁽²⁰⁾

Digital technologies have changed the learning environment, they have provided flexibilization and allowed learning in any place that has internet access.^(6,9,21) Their application in teaching-learning enables learning beyond the classroom space and facilitates access to content at any moment and place, according to nursing students.

The participants, however, affirmed that digital technologies do not contribute to motivating learning. The dissatisfaction and lack of motivation for the use of digital technologies in the pandemic for nursing learning constituted a reality in research in Saudi Arabia⁽⁶⁾ and Sweden,⁽²²⁾ which reinforces the necessity of adapted activities with clear instructions.

In this context, a report from the United Nations for Education, Science, and Culture indicates that the sudden entrance of teachers in a complex teaching modality composed of various technological and

pedagogical options never experimented with and without proper necessary training for its use may include unsatisfactory teaching-learning results.⁽²³⁾

Hence, we consider that the transposition of teaching methodologies in an abrupt way did not allow a familiarization process, understanding, and test of the new method applied, not only by the students but also by the teachers.

Efforts and investments must be made, aiming to provide permanent training of teachers and guarantee a better preparation for technological innovations offered in the education field.⁽²⁴⁾ Thus, urges an active role in the improvement of students' digital proficiency, contributing to the decrease of their difficulties in the use of digital tools.⁽²²⁾

Learning mediated by these technologies requires changes in the role of teachers and students for students to withdraw the role of receptors of knowledge and teachers to incentivize autonomy and knowledge construction, dismissing the total control of the process.⁽⁸⁾ It is important, thus, to project significant teaching-learning experiences that involve and motivate students without imposing digital barriers or sampling simplistic experiences.⁽¹⁰⁾

Studies report the adoption of different strategies for learning nursing history, and that favors students' engagement by contemplating digital educational technologies, such as sites, virtual learning objects, and virtual learning environments.⁽²⁵⁻²⁷⁾ Furthermore, we recognize them as attractive and involvement resources that captivate students' attention.^(25,28)

By limiting itself to the history of the nursing class institutions, its learning contributes to the development of a critical-reflexive sense of the political and social relations that involve the nursing professionalization process. The nurse professional practice fundamentalism involves the knowledge of nursing history, which includes class institutions.⁽²⁹⁾

Although nursing historians sustain that conception, participants from this research did not realize that knowledge is important for constructing a professional identity. However, we consider it relevant to highlight that the previous knowledge about historical facts allows planning and implementation

of the future of the profession, conform a professional identity, explores sensitive issues to the profession, and that influence the nature of the nursing workforce,⁽²⁵⁾ once that with the comprehension of the past, we search for answers in the present

Despite this perspective, controversially, when questioned about the contents of the nursing class institutions, the answers swung between "very important" and "indispensable." The ABEn is crucial in the fight and actions that result in the delineation and production of knowledge of the nursing science with incentivization in the nursing training and teaching, scientific research, and propagation among professionals.⁽³⁰⁻³⁴⁾ The Nursing Federal and Regional Councils grant legitimacy and autonomy to the specific practice of the profession.^(34,35)

These results signal that efforts must be carried out by teachers so that, imbued with the knowledge of nursing class institutions' history, the students identify themselves, learn, and discuss their contributions to the consolidation of nursing as a legitimate professional field.

We observed as a limitation of the study the number of respondents because the isolation hampered access to technologies and the internet for some, which may have compromised the data collection through electronic means.

Conclusion

The teaching-learning actions regarding the nursing class institutions' history mediated by digital technologies need to consider the profile of the students, their digital proficiency in the management of remote learning, as well as their learning interests. We highlight that new studies are fundamental to measuring teachers' digital proficiency, being important that other Brazilian regions also investigate students and teachers because, despite the regionalism in the country, the use of digital technology is an important legacy from the pandemic and will remain in nursing training. We still must consider the necessity of comprehending how the planning of educational activities that use these technologies is happening.

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Maia NMFS, Araújo AAC, Santos AMR, Santos FBO, Aperibense PGGS e Andrade EMLR collaborated with the conception of the study, analysis and data interpretation, writing of the article, relevant critical revision of the intellectual content and approval for the final version to be published.

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