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Digital fluency and the use of virtual environments: the characterization of nursing students*

FLUÊNCIA DIGITAL E USO DE AMBIENTES VIRTUAIS: CARACTERIZAÇÃO DE ALUNOS DE ENFERMAGEM

FLUIDEZ DIGITAL Y USO DE AMBIENTES VIRTUALES: CARACTERIZACIÒN DE ESTUDIANTES DE ENFERMERÍA

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ABSTRACT

The objective of this study was to characterize the profile of nursing undergraduate students, identify their digital fluency, knowledge, ability and interest in using virtual learning environments. This quantitative, exploratory-descriptive study, performed with 51 nursing undergraduate students. Data collection was performed using a questionnaire. All 51 subjects (100%) reported having some knowledge in informatics, 26 (49%) of which reported having an intermediate knowledge; 47 (92%) use the Internet everyday; 51 (100%) surf the social networks and have e-mail; 51 (100%) are MSN users; 32 (62.7%) use Skype; 41 (82%) use Chat applications; 33 (64.7%) use discussion forums; 22 (43%) use blogs; 33 (64.7%) frequently use Moodle and 26 (51%) use COL; 45 (88.2 %) reported interest in using virtual learning environments. The students are digitally fluent and show knowledge, ability and significant interest regarding the use of virtual learning environments in their academic studies.

DESCRIPTORS

Education, nursing
Educational technology
Nursing informatics

RESUMO

O objetivo do estudo foi caracterizar o perfil de licenciandos de enfermagem, identificar a fluência digital, o conhecimento, a habilidade e o interesse no uso de ambientes virtuais de aprendizagem. Trata-se de uma pesquisa quantitativa, exploratório-descritiva realizada com 51 licenciandos de enfermagem por meio de questionário. Dos participantes do estudo 51 (100%) afirmam ter conhecimento em informática, sendo que 26 (49%) indicam um nível intermediário; 47 (92%) fazem uso diário da Internet; 51 (100%) navegam em redes sociais e possuem e-mail; 51(100%) utilizam MSN e 32 (62,7%) Skype; 41 (82%) acessam Chats, 33 (64,7%) Fóruns de discussão e 22 (43%) Blogs; 33 (64,7%) utilizam frequentemente o Moodle e 26 (51%) o COL; e a grande maioria (45- 88,2%) relatou interesse no uso de ambientes virtuais de aprendizagem. Os alunos foram considerados fluentes digitais e apresentaram conhecimento, habilidade e expressivo interesse no uso de ambientes virtuais de aprendizagem em sua formação acadêmica.

DESCRITORES

Educação em enfermagem
Tecnologia educacional
Informática em enfermagem

RESUMEN

Este estudio objetivó caracterizar el perfil de alumnos de enfermería, identificar su fluidez digital, conocimiento, habilidad e interés en uso de ambientes virtuales de aprendizaje. Investigación cuantitativa, exploratorio-descriptiva, realizada con 51 alumnos de Enfermería mediante cuestionario. De los participantes, 51 (100%) afirman tener conocimientos de informática, 26 (49%) refieren nivel intermedio; 47 (92%) utilizan Internet diariamente; 51 (100%) participan en redes sociales y poseen e-mail; 51 (100%) utilizan MSN y 32 (62,7%) Skype; 41 (82%) acceden a Chats; 33 (64,7%) escriben en foros de discusión y 22 (43%) en Blogs; 33 (64,7%) utilizan frecuentemente Moodle y 26 (51%) COL; y la gran mayoría (45, 88,2%) expresaron interés en utilización de ambientes virtuales de aprendizaje. Se consideró a los alumnos con fluidez digital, demostraron conocimientos, habilidad y expreso interés en utilización de ambientes virtuales de aprendizaje en su formación académica.

DESCRIPTORES

Educación en enfermería
Tecnología educacional
Informática aplicada a la enfermería

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INTRODUCTION

Globalization is a complex, multifaceted phenomenon that has affected contemporary society since the 20th century. This phenomenon refers to the way countries interact and bring people closer, i.e., it establishes connections in the world regarding the economic, social, cultural, and political aspects. It is clear that advancements in science and technology have caused extensive changes and effects on higher education[1].

One such change is the overwhelming adoption of information and communication technologies (ICT) in general society and in academia, thus transforming subjects, processes, and products.

ICT are characterized by data transmission processes through electronic devices and optic resources[2]. The major ICT product is the Internet, which is considered a powerful communication tool that reduces distances, connects researchers, and permits to easily locate the produced information in a variety of files from different field of knowledge[3].

In education, one issue on the agenda, which educators constantly debate on, is the use of the referred technologies, as they offer new possibilities of learning, because they integrate several languages and resources, thus, moving from the category of simple learning aids to the center of a new form of learning, and changing, among many other factors, the way that communication and interaction occur.

The thought of using technological resources as the vehicles of educational contents proposes to understand it as a dialogic instrument of interaction and of measuring knowledge, besides being a way to find new forms of learning, breaking with the practice of the current traditional model[4].

These new technological paradigms, optimized by the speed of computerization, nearly generalized in society, are present across the world, including in countries such as Brazil, which have considerable social and regional inequalities that are determining factors especially in terms of preparing individuals for the labor market in large urban centers[5].

Overcoming the barriers to implement an effective use of technology in schools depends on parallel movements involving: the teacher, in the sense of providing education permeated by the incorporation of technology, a permanent education that prepares individuals to use these technologies and encourages them to think about their pedagogical practices; the educational system, as it is responsible for implementing the necessary conditions to incorporate technology in school; and students, who are the subjects directly involved in this process[6].

Educational reforms have occurred as an attempt to guarantee more efficient learning, integrating technology to pedagogical methods. Education must walk hand and hand with computerization, as there is a significant amount of technological resources available[7].

It is necessary to observe that, in order to implement new technologies, curricular changes must be made at teaching institutions, focusing on meaningful learning and on the development of competences aiming at the future professional in the labor market.

The use of ICT associated with a new form of teaching will promote the development of a new learning environment in the attempt to prepare this new citizen through the multiple possibilities that are offered[8].

Therefore, education opens the doors to using technology traditionally as well as in blended or Distant Education (DE) modalities. Virtual learning environments permit the use of several resources that otherwise could not be taken full advantage of in regular on-site classes.

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Online education is referred to as a group of teaching-learning activities developed using electronic means, such as the Internet and all its informational and communicational devices[9].

Within this challenging setting emerges the area of nursing education, in view of the advancement of information and communication technologies in the many academia environments. This focus instigates educators to learn, analyze and transform these new technologies into an educational tool in line with the political, economic, social, and cultural conditions in which learning occurs, as well as to meet the demands of a university clientele considered to be a digital generation.

In this context, the course for the Licentiate Degree in Nursing at the University of São Paulo School of Nursing (*Enfermagem da Escola de Enfermagem da Universidade de São Paulo* - EEUSP) aims at preparing faculty that is critical, ethical and committed to a proposal of preparing human resources in nursing to meet the demands of the labor market.

Using ICT, especially in virtual learning environments in nursing, is a promising and engaging educational possibility. These environments promote knowledge development and interaction between students, faculty, and tutors, which enriches the sharing of ideas and permits dynamic and collaborative learning.

These environments are based on educational principles that promote the re(construction) of knowledge, authorship, the collaborative production of knowledge, and meaningful learning, which allows for increasing the

physical area of the classroom, while a place for learning, and the different forms of interaction, thus, comprising learning networks.

In view of this evidence, literature has pointed at the ultimate need to promote the implementation of educational proposals to use virtual learning environments in nursing, with a view to foster distance learning by means of technologies that permit to perform individual activities and also promote learning that is collaborative, interactive, and flexible.

Therefore, in order to make an effective use of technologies in the educational process, it is necessary to identify the profile of the students and the necessary for its implementation.

OBJECTIVES

- To characterize the profile of the students in the Licentiate in Nursing course;
- To identify the digital fluency of licentiate students;
- To identify licentiate students' knowledge, skills and interest in using Virtual Learning Environments (VLE).

METHOD

This descriptive, exploratory study was performed using a quantitative approach. The research project was approved by the EEUSP Research Ethics Committee, process number 896/2010/CEP-EEUSP.

The study was performed at EEUSP. The study population consisted of the 136 students enrolled in the classes of Didactics, Policy and Organization of Basic Education in Brazil, and Nursing Teaching Methodology I, as these are the class disciplines comprising the Licentiate in Nursing course curriculum.

The researchers approached the licentiate students at the university during their class break, and invited them to participate in the study, explaining the objectives of the research. Upon their agreement to participate, the students received the Free and Informed Consent Form, and were certified about the confidentiality of the information, their free participation and the possibility to withdraw from the study at any time.

Data were collected in April and May 2010, with 51 nursing licentiate students, using a questionnaire that had been previously tested. The data collection instrument contained 31 open and closed questions, and was divided into three parts: Part I – characterizing the profile of nursing licentiate students; Part II – identifying digital fluency, and Part III – identifying their knowledge, skills, and interest to use VLE.

The data were input on an electronic worksheet (*Excel®*) and analyzed using descriptive statistics. The categorical variables of the study were shown as absolute numbers and percentages.

RESULTS

As to their profile, of the 51 (100%) participants, 49 (96%) students were female, with a mean age of 24.4 years, 32 (62.7%) were undergraduate students, and 19 (37.2%) had already graduated as nurses. As to their marital status, 46 (90.2%) were single, only 3 (5%) had children, and 39 (76.4%) reported they were not working at that time. Regarding their education, most students attended private school, 26 (51%) during the first four years of primary education (in Brazil referred to as fundamental I), 29 (56.8%) during the last four years of primary education (in Brazil referred to as fundamental II), and 32 (62.7%) during secondary education.

Regarding digital fluency, all the 51 participants (100%) reported having some informatics knowledge, 17 (33.3%) at a beginner's level, 26 (51%) at an intermediate level, and 8 (15.7%) at an advanced level.

It is emphasized that 51 (100%) students reported using the Internet and having an e-mail account, with 47 (92%) reporting they used it every day, and the main places of access were their own home, for 43 (85%), and the university, for 11 (21%).

The most used *Microsoft Office* package software were: *Word* — 51 (100%); *Power Point* — 46 (90.2%); and *Excel* — 30 (58.8%).

Regarding social networks, 51 (100%) students reported using them: *Orkut* was the most used— 47(92%) —, followed by *Facebook* — 18 (35.3%). Analyzing their skills, 51 (100%) had an e-mail account and used MSN, 32 (62.7%) used *Skype*, 41 (82%) had used some form of *chat* software, and 33 (64.7%) had participated in discussion forums. Regarding *blogs*, 22 (43%) students reported having some level of knowledge.

The analysis of the results regarding the students' informatics skills reveals that, of the 51 (100%) participants, 48 (94%) were able to install software on their computer, and 51 (100%) were skilled at creating and moving folders and files, besides saving them on a hard disk, CD ROM, diskette, and USB flash drive, move files to the Trash, and permanently deleting them, saving and printing a copy, include images, charts or tables in a file, send, delete, answer and print e-mail messages, and participate in online group discussions. In addition, 45 (88.2%) students were able to decompress a file, only nine (17.6%) acknowledge the importance of performing backups, and 10 (19.6%) referred no knowing how to use a word processor. It was found that 46 (90.2%) students were skilled at surfing the Internet, 28 (55%) do not know what a plug-in is and

how to install one, and only seven (14.7%) students are able to read web file formats such as GIF, JPG, PDF, DC, PPT, XLS, ZIP, among others. Regarding their ability to tell whether the information on a website is reliable or valid, 42 (82.3%) believe they are incapable, 49 (96%) students are able to discover the address of people and institutions using web browsers, and 41 (80.4%) are able to download files using web browsers.

Therefore, results show that nursing licentiate students are digitally fluent, as they are able to find, evaluate, and use digital information in an effective, efficient and ethical way[10].

Regarding the students' knowledge and ability to use virtual learning environments, it was found that 33 (64.7%) often used *Moodle*, and 26 (51%) used COL. Participants reported not using any of the other platforms that were presented, such as *WebCT*, *Blackboard*, TelEduc, and VIASK. Regarding the students' view of how easy it was to use the environments, 24 (47%) considered *Moodle* and COL to be of easy access.

Regarding their interest towards using virtual learning environments (VLE), 45 (88.2%) students reported they would like to use VLE during their academic education, and some also highlighted they would like that because: it is useful to store the classes that were given; it optimizes time; virtual environments are more flexible regarding the location and the time of access; they provide other means and tools in the teaching-learning process, offering a change from the tedious traditional model; it makes student-student and student-teacher communication easier, and with the advancement of technology we must be prepared to work in different environments, because informatics is more and more present in the professions.

DISCUSSION

By comparing the profile of nursing licentiate students to those found in previous studies with nursing students, similar results are found, as most were female, with a mean age around 25 years and single. The difference to these studies regards the number of students who work, which are the majority in private institutions compared to public schools[11-13].

Regarding their education, 62.7% attended secondary education at private schools. This result differs from a previous study that found that 83% of university students had completed their secondary education in public schools[14].

The analysis of digital fluency found that 51 (100%) participants reported having some level of knowledge in informatics, and most rated themselves as having an intermediate level, followed by those in the beginner's and advanced levels. Similar results were found in a study performed with 90 university students of 18 different courses in Brasília[15]. This way, we emphasize that this generation deals with technologies easily, as their first contact with a computer occurs during childhood or early in adolescence[14].

Results were unanimous regarding the students' use of the Internet, and a growing and steady adherence to the many social networks that have emerged, proving that cyberspace is a crucial factor in the increment of the currently available cultural and social capital. In this sense, adopting different forms of teaching, especially regarding the use of technologies, is in line with the interests, skills and competences of these students, the young population of the digital era, thus promoting pleasant and meaningful learning.

The present study results surpass those found in a study performed with 80 students of a public college of nursing in the city of São Paulo, in 2003, regarding the level of their Internet skills. It was found that 55.5% of the participants were better skilled at using e-mails, 50% had no ability with forums, while regarding chats, 22.2% and 33.3% of students had, respectively, none or regular skills[16]. It should be considered that the seven-year interval between the studies was significant in showing an important advancement in including information and communication technologies among in nursing courses.

These indicative factors point at the need to review distance education as an emerging educational possibility in nursing, as it is an educational modality whose development is associated with the student's ability to manage time; the development of autonomy to perform the recommended activities when they consider it appropriate, provided the student complies with the deadlines established in the course; conversations with peers to exchange information and develop collaborative work[17].

In this view, distance learning is taking on its role in disseminating human knowledge and has a substantial potential in the health area, due to the large amount of information, which is growing geometrically and demanding professionals to learn continuously[18].

Furthermore, the flexibility of DE also permits individual autonomy and intellectual freedom because it meets the needs of professional education/training without students habving to leave their workplace[19].

Moreover, literature emphasized that a virtual student is considered successful when older and more mature; self-taught; who knows how to manage his or her agenda so all activities are performed without the need to be reminded by the professor; who makes questions and is analytical; exchanges information; offers suggestions and opinions; and elaborates on and expresses ideas in a clear and concise way[20].

We also highlight that the successful outcome of a distance education student is directly associated with factors such as the tool being used, the way the professor leads

his or her group and, especially, the student's motivation to take the course and his or her access to the resources required for the desired interactivity.

This way, computer-mediated teaching methodologies help increase and diversify the forms of communication between students and professors[21].

Students report their expressive interest in using virtual learning environments in their education, and emphasize that the advantage of having access to the educational materials and environment facilitate their learning because it offers flexibility to their study times. However, some answers revealed that the environment is used as a simple way to store educational contents, and they are used as a complementary tool in the traditional on-site education, a model that must be overcome.

Distance learning eliminate time and space barriers, and open the doors of education for people who face difficulties to attend a course either because of dislocation or because of course hours. Therefore, distance learning offers more availability and paces for students to establish their study scheme.

Today, it is common for students to balance academic and professional activities together, so the lack of time to study and perform activities is a present reality. In this sense, virtual environments are relevant strategies for these students, because their permit them to organize their time according to their personal possibilities; this requires students to adopt a new attitude towards the teaching-learning process.

Globalization is a reality, and, associated with the advancements in technology, it permits information to circulate very quickly, causing extensive changes in academic education and in the labor market. The development of ICT competences begins in the university, which must provide the necessary means for students to become ready and competitive in the labor market, which has demanded professionals to be more and more agile, flexible and have brad knowledge.

These competences must contemplate not only the technical-scientific dimension, but also the ethical dimension, because ICT promotes uncountable and very noticeable advancements, accessibility and benefits. However, technical skills and knowledge are not sufficient to make an adequate, effective and ethical use of ICT. It is necessary to take the ethical dimension into consideration. This concern originates from the vulnerability generated by the interference in the individuals' autonomy, privacy and security.

Therefore, individuals must be aware of the benefits as well as of the risks involved, because risks and benefits are two faces of one same coin, hence the need to keep an analytical attitude to make advancements in technology but, on the other hand, becoming aware of the risks that are involved.

The implementation and use of technology cannot be done uncritically, because technology alone is neither good nor bad, it must only be adequately used, because one cannot ignore the inherent ethical aspects.

CONCLUSION

The present study results permitted to conclude that the licentiate students of the University of São Paulo School of Nursing are digitally fluent, and have knowledge, skills, and an expressive interest in using virtual learning environment in their academic education.

We believe that Information and Communication Technologies are viable tools for faculty to improve their educational practices. However, they must adjust to this new reality of dealing with digital students, who assign new meanings to their own knowledge, seeking not only transformations in their discourses but also in how they understand and use the referred technologies.

Regarding the students, despite their skills and knowledge in different technologies, especially in terms of computers with access to the Internet, and knowing the importance that resources have as facilitators in their studies, it was found they still show some reservation towards distance education. Perhaps this occurs due to a lack of information or the existence of controversial information from the inadequate use of resources.

Therefore, it is extremely important for the faculty to know the profile of their students, as well as their understanding, experiences, and interests in order to conduct the teaching-learning processed satisfactorily, adjusting the virtual environment to the students' needs.

The current educational culture of a university that offers lectures and has professors who assume an attitude of one who holds all knowledge still resists, somehow, among the *online* generation. Overcoming old paradigms to change the educational culture is part of a long process that is only beginning, but is developed along the way.

Using technologies and virtual learning environments should be valued in the education of nursing licentiates, increasing their possibilities of education to work in the secondary level and in courses that prepare nursing aides and technicians. The present study results will permit faculty to look at new pedagogical practices that meet the profile of the licentiate students of the USP School of Nursing, thus contributing to the development of licentiate programs in nursing.

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