

Abstracts IJEE 3 (2)

Nursing Students' Satisfaction during their First Year of Study in a Private University as regards the Integration of ICTs (link is external)

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Received: 10 February 2017 • Accepted: 07 April 2017

International Journal of Educational Excellence

(2017) Vol. 3, No. 2, 35-74

ISSN 2373-5929

doi: 10.18562/ijee.027

Abstract: The University, in keeping with the times, is moving towards a greater use of technology. Currently, college students are more exposed to technology integrated to the academic field as well as in their daily lives. This research article aims to measure Nursing students' satisfaction during their first year as regards the Integration of Information and Communication Technology (ICTs). The study was carried out in a private university during the 2015-2016 school year. The studied population consisted of 1,130 students enrolled in the Nursing program. Of these, two-hundred-and-ten student (210) were in their first year. We aim to investigate how Nursing students regard Internet use, technological knowledge applied to information and its relation to ICTs in a higher education setting. On the other hand, we will be able to observe whether there is any correlation between Nursing students' degree of satisfaction and knowledge as regards ICTs and sociodemographic variables. We propose that students exposed to ICTs will have a greater degree of satisfaction and academic achievement as compared to students not exposed to this type of technological tools. This study can help identify the most frequently used tools by students in the academic field as well as the need for technological innovation in Nursing programs curricula. This way, a curriculum adapted to technological innovation in the health field can be developed to prepare students in the use and correct management of ICT integration in an educational context.

Resumen: La universidad, acorde con los tiempos, se está moviendo a un mayor uso de la tecnología. Actualmente, los estudiantes universitarios están más expuestos a la tecnología integrada en el ámbito académico y en su diario vivir. Este artículo de investigación pretende medir el nivel de satisfacción de los estudiantes de Enfermería en su primer año en torno a la integración de las Tecnología de Información y Comunicación (TIC). Fue realizada en una universidad privada en el año académico 2015-16. La población estudiada fue de 1,130 estudiantes matriculados bajo el programa de Enfermería. De este total, hay doscientos diez estudiantes (210) clasificados en el primer año. Deseamos investigar la apreciación de los estudiantes de Enfermería para con el uso de

la Internet, sus conocimientos tecnológicos en aplicaciones de informática y su relación con las TIC en el contexto universitario. Por otra parte, se podrá observar si existe relación entre la satisfacción de los estudiantes de Enfermería y su conocimiento con las TIC con relación a las variables sociodemográficas. Planteamos que los estudiantes expuestos a las Tecnologías de la Información y Comunicación (TIC) tendrán mayor satisfacción y aprovechamiento académico que los estudiantes que no están expuestos a este tipo de herramientas tecnológicas. Este estudio puede ayudar a reconocer las herramientas más utilizadas por los estudiantes en el ámbito académico y las necesidades de innovación tecnología en los currículos de los programas de Enfermería. De esta manera, se puede establecer un currículo atemperado con la innovación tecnológica en el ámbito de la salud y preparar a los estudiantes en el uso y manejo correcto de la integración de las TIC en un contexto educativo.

Key-Words: Nursing Students, Student Satisfaction, Nursing Programs, Information and Communication Technology (ICT), ICT Competence in Nursing, Teaching Methodologies, Professional Development.

Palabras clave: Estudiantes de Enfermería, Satisfacción Estudiantil, Programas de Enfermería, Tecnologías de Información de Comunicación (TIC), Competencias en TIC en Enfermería, Metodologías de Enseñanza, Desarrollo Profesional.

Nursing Students' Satisfaction during their First Year of Study in a Private University as regards the Integration of ICTs

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Received: 10 February 2017 • Accepted: 07 April 2017

Abstract: The University, in keeping with the times, is moving towards a greater use of technology. Currently, college students are more exposed to technology integrated to the academic field as well as in their daily lives. This research article aims to measure Nursing students' satisfaction during their first year as regards the Integration of Information and Communication Technology (ICTs). The study was carried out in a private university during the 2015-2016 school year. The studied population consisted of 1,130 students enrolled in the Nursing program. Of these, two-hundred-and-ten student (210) were in their first year. We aim to investigate how Nursing students regard Internet use, technological knowledge applied to information and its relation to ICTs in a higher education setting. On the other hand, we will be able to observe whether there is any correlation between Nursing students' degree of satisfaction and knowledge as regards ICTs and sociodemographic variables. We propose that students exposed to ICTs will have a greater degree of satisfaction and academic achievement as compared to students not exposed to this type of technological tools. This study can help identify the most frequently used tools by students in the academic field as well as the need for technological innovation in Nursing programs curricula. This way, a curriculum adapted to technological innovation in the health field can be developed to prepare students in the use and correct management of ICT integration in an educational context.

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1. Introduction

Due to the arrival of technology as a tool to facilitate students' learning process, researchers in different countries have taken it upon themselves to measure the degree of technological integration in professional Nursing programs at the college level. The use, content adaptation and integration of technology in curricula appear to be elements defined by researchers according to their own reality and study environments.

The integration of Information and Communication technology (ICT) in the Nursing profession consists of two interlinking fields. The first is the integration of ICT in learning, which refers to the transformation of Nursing education so it entails a dependence on technology to offer classes and allow students to develop as professionals within the Nursing field.

The second field refers to the integration of ICTs to professional practice, which is the movement existing in health institutions where Nursing alumni work. These scenarios involve complex, highly technological equipment and machinery, and the use of ICTs is part of daily practice for nurses when offering care and treatment for patients (García Martínez, 2011; Llorente and Cabero, 2005).

Higher education is going through a series of changes which force it to acclimate to the demands and needs of current society, for which reason the academic field must be adapted to the needs of the university population. The university is confronting new challenges, including the integration of technology in curricula. Therefore, it is necessary for students to acquire the necessary competencies in an innovative world of extraordinary progress. The objective of this course of actions (Ballesteros, Franco and Carañana, 2012) is to encourage up-to-date information and education to meet the new demands of the work force.

1.1. Definition of Information and Communication Technology (ICT)

Information and Communication Technology is a concept which includes the Internet, computer and informatics to modify the way new generations are educated.

Although there are different definitions for the term ICT, we are adopting the definition by Adell as cited by Boude-Figueredo and Ruiz-Quintero (2008, p. 230) for the purposes of this research paper, which define it as "the set of tools and procedures which allow for the acquisition, production, storage, treatment, communication, registry and presentation of information in spoken, photographic and data form contained as acoustic, optical or electromagnetic signals". ICT also includes electronics as technology aimed towards the support of telecommunications, informatics and audiovisual resources.

1.2. ICT as tools for the classrooms

We should highlight that what offers real potential in the classroom is the pedagogical use professors ascribe to the use of technology. Incorporating these tools to the educational experience should be the product of a constant reflection by faculty members. Some of the elements to consider are the teaching strategy used, skills to be developed, topic and problem studied in the classroom.

For the student to achieve academic success by means of ICTs, he or she must be learned in informatics and the competencies required for the proper use of technology. In this case, competency refers to a complex process by means of which the person carries out activities and solves problems articulating the knowledge and know-how with self-sufficiency, criticism and creativity. This simultaneously involves know-how, performance and attitudes. Know-how is associated with the dimension of knowledge; performance is associated with actions, including procedures, product development and strategies; attitudes can be placed within the dimension of being, along with motivation, initiative, disposition and other characteristics which can be identified in the personality of a competent individual. A competent person can be said to be qualified to carry out an activity, which means integrating knowledge, skills, disposition and specific conducts to carry it out.

Informatics in Nursing began to form part of curricula and direct patient care in hospital units, where they became integrated into the work field, since ICTs extends to health services in the midst of a cybernetic society. A Nursing student of a university which integrates ICTs as part of the teaching and learning processes must know the basic concepts regarding computer management and Internet use (Boude-Figueroa and Ruiz-Quintero, 2008).

Since the beginning of the millennia, great advances in technology have occurred so that the latest generations of students can easily access online information. Navigating in the Worldwide Web (WWW) is no longer a fixed activity, given that mobile devices such as laptops, cellphones and digital audio devices make access to the Internet possible at almost any time and place.

Wireless Internet access is provided to college students and ICTs are used as learning tools to promote access to downloadable teaching material (PowerPoint, video, audio, etc.) from Web sites (Harris and Krousgrill, 2008). As previously mentioned, teaching material and information is readily available for students in different forms independently of the time and place (Reynolds et al, 2008).

1.3. Definition of information technology integration

Morton (1996), as cited by Días (2009), pointed out that ICT integration does not just imply considering the computer as a tool. He considers that ICTs

can be thought of like any other tool, such as a whiteboard or projector, which can be used with little to no preparation.

Morton's vision leads us to consider the computer as a tool, allowing curriculum planners to keep working with the traditional concept of education based on the subject and the teacher as a transmitter of knowledge. The computer remains peripheral and marginal. That is to say, taking students to a computer lab does not necessarily imply integration, nor does using the computer as an electronic spreadsheet or allowing students who have finished work in other areas to use it.

Tejedor, García-Valcárcel and Prada (2009) have defined information and communication technology integration as the current means by which we remain connected to the world, part of the globalization process and daily life, whether it be in the domains of government, commerce, education, safety or health. It entails not just the ability to use the computer or Internet, but to intelligently use these tools to exalt human nature and promote wellbeing, particularly in educational settings.

ICTs are successfully integrated when they are used to support and broaden curricular objectives and to encourage students to better understand and construct knowledge. Its use should be part of the daily activities carried out in the classroom. That is to say, the objective is to involve students in the construction of knowledge and ascertain their understanding of the content presented. ICTs enrich activities and encourage students to demonstrate what they know in new and creative ways.

1.4. Learning environments

The integration of ICTs in curricula does not occur in one particular place, but rather in a specific learning environment. To build an environment ripe for integration, we must change our focus on teaching and learning. Many believe that it is easier for integration to occur in classes that promote knowledge construction and in which the professor acts as a facilitator. It is fundamental to pay special attention to the improvement of skills in ICT management by college personnel (Rozas et al, 2008).

Cabrero (2003) considers that the integration of ICTs to the educational sector is framed within a situation of change in educational models, in information users and occur in settings of constant transformation. This researcher defines the integration of ICTs as a modern cybernetic phenomenon whereby learning is produced and information is exchanged by electronic means using the Internet. The use of these tools imposes new forms of action for professors and students. It is not just using technology for the sake of using it, but about how, through its use, teaching methods are developed to make the process more efficient.

According to Jonassen (1995), learning environments consist of seven aspects which make them significant: the Active aspect, whereby students

participate processing information; the Constructive aspect, whereby students integrate new ideas to their wealth of knowledge; the Collaborative aspect, whereby students work in a community of learning in which each member makes his or her contribution, both to attain the established goals and to maximize others' learning; the Intentional aspect, by which students try to attain clear milestones and knowledge-related objectives (Internet, e-mail and video conferences), which allow them to expand these communities beyond the classroom; the Contextualized aspect, by which students carry out chores or projects related to real-life situations, or where these are simulated through activities centered on problem solving; and the Reflexive aspect, whereby students reflect on the processes carried out and decisions taken upon the completion of a project or chore and seek to articulate the learned content.

1.5. Informatics in Nursing

Universities have the responsibility of preparing alumni to carry out their professional roles according to the requirements of the work field. For this reason, research has been a means by which universities maintain their curricula updated, but it is no less true that the influence of social and work trends are also aspects considered by academic programs for the preparation of students.

The integration of ICTs during the last two decades in health systems has transformed health institutions into advanced establishments completely dependent on communication technology. Technology facilitates the diagnosis, treatment, monitoring and documentation of patient care (Gracia Martínez, 2011).

Currently, with the arrival of the Internet, the workforce of a globalized market has provoked an unprecedented transformation in health services. As a result of this global movement, Hernández Cortina, Wigodski Sirebrenik and Caballero Muñoz (2012) point out that informatics in Nursing became a discipline linking Nursing, informatics and information and communication technologies. They describe it as a basic competency for health professionals in general and nurses in particular for the 21st century. Its function is to interpret data to transform it into information and interpret information to transform it into knowledge so that it, through experience, can transform into wisdom. Caring is at the core of Nursing, and it requires nurses capable of critical thinking who are competent with technology without dehumanizing their actions, a skill which should be developed during the study of the profession.

During the late 60s, the first computer-based system was installed in developed countries. Its main purpose was the processing of orders, charge sheets and invoicing. Computers, digital agendas and digital audio recorders began to replace paper. As part of this development process, Nursing personnel has contributed to the acquisition, design and implantation of these

technologies, beginning during the 80s and, due to technological development, transforming into a new discipline, informatics in Nursing.

Hovenga (2007) points out that the first works in the informatics area within Nursing were published by Ball and Hannah, 1984; Grobe, 1988; and Hannah, 1985. Nurses which began working during that time were pioneers of the discipline and often began without realizing it, being involved with technology or out of simple curiosity to explore new fields of knowledge. The development of informatics in Nursing has been quick and has facilitated the integration of data, information and knowledge for support in the decision-making process of Nursing professionals as regards patient care.

The quality initiatives of the Institute of Medicine (IOM) from the 90s are still valid today. They are centered on the following safety tenets: Effective, Patient-centered, Timely, Efficient, Safe and Equitable.

These safety objectives are contained within the concept of “quality care” in the document entitled *Nursing: Scope and Standards of Practice of the ANA*. In this document, one of the central aspects set forth to improve practice is the proper use of ICTs and of information and knowledge within Nursing. This document defines the who, what, how, where, when and why of Nursing.

The relevance of informatics and ICTs within Nursing lies in the need to document and communicate patient care to guarantee continuity and uninterrupted quality. In fact, if Nursing data is to be included as information for the management level, it is crucial that it respond to the trends of hospitals with high technological and cybernetic proficiency.

The use of technology is crucial in the professional formation, not just because nurses at the forefront, but because they need to learn to use technology correctly, without dehumanizing. The focuses of care are the person, family and community, which can often be forgotten when technology is placed at the center.

Most current Nursing curricula have integrated aspects related to informatics and the application of the Nursing process, and have begun to digitally document information. Nursing schools have incorporated topics related to informatics in Nursing, basic computer classes, or workshops regarding the use of ICTs within the field of study. This has been deemed the re-evolution of Nursing, an evolution of the discipline towards its center, towards cybernetics or digitally-assisted care aimed towards improving precision in Nursing care as well as ensuring safe treatment for the patient.

One of the advances generated in the United States was the creation of TIGER. TIGER is a guiding principle for the educational reform within Nursing using information technology which allows Nursing professionals and students to participate fully in the development of the digital era of health services, building competencies, knowledge management, clinical standards and better practices (Hernández Cortina, Wigodski Sirebrenik and Caballero

Muñoz, 2012). In this sense, and considering the lack of information development within Nursing in Puerto Rico, it is necessary for Nursing curricula to adjust to this reality, as the trend in Nursing is towards ICT-centered practices.

1.6. Nursing based on Information and communication technology

ICTs are tools to improve communication and knowledge management within research, and at its center is the firm conviction that it will be the path towards improved health, wellbeing and towards economic improvement. These technologies are being incorporated in order to optimize existing resources. The application of ICTs holds an enormous amount of possibilities, and it plays a fundamental role in the future of public health in practically every process associated with health systems and scenarios within which related services can be provided (home, hospitals, workplaces, etcetera).

Espinola López, Ojeda Delgado, Ramos Ramírez and Robertti Pereira (2011) mention the tools used within health systems and which directly or indirectly affect Nursing services when integrating ICTs. These have been shown to be useful improving the quality of services within a reasonable and cost-effective period, for which reason they are evidently necessary when providing health services.

These authors point out that ICTs form part of contemporary health systems, and that Nursing professionals make use the following resources: digital clinical history, tele-nursing, tele-monitoring, tele-alarm, tele-consultation and tele-continuity of care. Additional resources include data collection and transmission, follow-up by phone and nursing intervention for fragile patients discharged during the weekend, as well as tele-information and tele-teaching.

Tejada Domínguez and Ruiz Domínguez (2010) point out that ICTs can generate a new model for the health services field and begin to transform the current health system, opening a wide range of possibilities for the renovation and improvement of relationships between citizens, patients and health professionals.

Factors such as an aging population, changes in lifestyle and growing life expectancy, among others, cause an increase in health expenditure due to excessive caseloads. ICTs have come to form part of the health systems, with the objective of holding up one of the fundamental pillars of wellbeing. ICTs help organize health services, optimize existing resources and provide better quality in services to patients.

ICTs have been shown to reinforce, support and improve the current health model, and Nursing, immersed in this scenario, has begun to make use of ICTs to guarantee attention, coverage and continuity of care, to improve the communication processes and to adapt available health resources to existing needs.

Tejeda Domínguez and Ruiz Domínguez (2010) add Health Portals as another use for ICTs. These are considered the gateway to satisfy the information needs existing within everything related to health services. Their goal is to improve health, quality of life and, it goes without saying, the wellbeing of citizens, through information, education for improved health and encouraging healthy lifestyles.

As regards tele-teaching, Tejeda Domínguez and Ruiz Domínguez (2010) add that the development of new technologies is generating different formation models, whereby teaching methodology and learning within the discipline of Nursing must be imbued with innovative tools such as technical and pedagogical support: one of these tools is the learning method known as e-learning. E-learning is a distance and web-based methodology which allows the professional to simply and comfortably obtain the desired expertise at any time and place. Moreover, it allows for outreach towards a large and geographically dispersed audience within relatively short time lapses. This new method of online formation requires an adequate computer-based teaching methodology through which both student and professor can carry out the formation process wholly and interactively. There are different types of such available in the market, such as Moodle, Dokeos, Ilias, etc. Their differences lie mainly in the resources offered, such as discussion forums, chats, live conferences, workshops, glossaries, questionnaires, instant messaging, web links, etc.

Moreover, through e-learning platforms, the professor or tutor can provide the study material in whatever format is most convenient (Word, PDF, doc.xls, etcetera), and they allow for self-assessment and for sending messages and recommendations with the purpose of encouraging student participation in forums and chats, besides the ability to share academic chores.

González Ortega (2010) points out that ICTs represent a new strategy for Nursing which all universities and health systems should take advantage of at an international level. The author maintains that universities around the world have realized that Nursing is not just limited to care. Information technology can serve to acquire, produce, store, communicate, register and present information for nurses and other health professionals. They become one more gateway to encourage the diffusion of scientific evidence centered on people, families and communities.

ICTs include electronics as technology to support the development of telecommunications, informatics and audiovisual resources, and allows for the creation, generation, improvement and diffusion of knowledge in Nursing generated throughout its disciplinary development.

For Rexach (2003), the use of ICTs demands a wide and complex definition of the terms “alphabetized”, which imply competencies well beyond reading and writing in a computer. To be “alphabetized” implies possessing certain experience in the processing and sharing of information,

and it means being a critical and participatory reader. It could be said that nurses must be prepared to take on these new challenges and reflect on the professional implication of connecting to a technological web for communication, to acquire the competencies such a connection demands, including willfulness, and to know why and for whom the effort of using these new forms of digital communication is worth taking.

Not only have ICTs been integrated into health systems, but they have also been incorporated within Nursing education. Authors such as Sangrà i Morer and González Sanmamed (2004) point out that this great development has encouraged some writers within the health field to investigate teaching methodologies associated with the role of ICTs in Nursing. According to these authors, Nursing education through ICTs cannot occur at random and must be adequately planned out, which implies integrating ICTs to the theoretical content of the profession to later apply them in practical settings. For the practice of future health professionals to be successful, it must take place in hospital settings with integrated ICT services. This way, Nursing students will be able to understand the pertinence of using ICTs and develop the necessary skills in technological care.

2. Methodology

2.1 Design

The design was quantitative, transversal, descriptive and inferential, with a population of first year students within the Nursing program of a private university in San Juan, Puerto Rico.

2.2. Population

The population which makes up the study is of 210 students. All of them are enrolled in their first year of the Nursing program of a private university in San Juan, Puerto Rico. The sample is equivalent to the population, consisting of 210 students with an average GPA of 2.91 in a 4.0 scale upon graduation from High School.

The inclusion criteria for the sample were the following: first year students enrolled for the first time in an Associate's Degree (ADN) or Bachelor's Degree (BSN) Nursing Program, of either gender, older than 18 years and enrolled in either a day or night program.

The exclusion criteria were students within the Nursing program enrolled in their 2nd, 3rd, 4th year of study or more, students from other faculties, school, concentrations or careers as well as those less than 18 years old.

2.3. Participant recruitment

The researcher, as a member of the faculty where the research was carried out, took the following measures into consideration in order to minimize a conflict of interests:

She requested a waiver for the informed consent form, as per the principles of the Common rule for the protection of human subjects. The use of the informed consent form would have represented a significant disadvantage in the study, as potential participants were students at the university where the researcher works. Therefore, it would result in a possible bias in participants' responses, which would result in a study with untrustworthy results, in studies where the principle set forth in 45 CFR 46.117.c (1) is applied. The research could not have been carried out without the waiver, since the sole document connecting the participant to the investigation is the consent form, and the main risk factor would result from a breach of confidentiality.

The researcher read the informational sheet and instructions aloud to ensure comprehension and allowed time to answer questions. Once the orientation process was completed, the researcher gave the participant the informational sheet including the research description, risks, benefits and information regarding the protection of privacy and confidentiality. Participants were also informed that the questionnaire was anonymous and no personal information such as phone number, name or address of the participants was required, as well as that completing the questionnaires would take 15 to 20 minutes. Likewise, participants were informed that the risks were minimum, such as fatigue, boredom or lack of interest. Subjects who did not participate in the study should not fear retaliation by the researcher, as the study was completely free and voluntary. The informational sheet given to participants and read during the orientation indicated that participation was completely voluntary and that, should participants choose not to complete the questionnaire, they could do so at any moment without expecting retaliation by the researcher. Once the orientation for the investigation was complete and the questionnaires were handed out, the researcher was available to answer doubts or questions. Once the questionnaire was filled out, students were instructed to store it in the provided manila folder and deposit it in an urn provide and placed in front of the desk. Once the students had finished, the researcher proceeded to collect the urn and leave the classroom. The researcher was sole custodian of the urn and ensured nobody had access to it.

Once the data collection process was complete, the researcher proceeded to tabulate and analyze them. Information was not and will not be shared with third parties under any circumstances. Data collected from questionnaires were stored in a private place, in the researcher's house, safe and locked. All questionnaires will be stored in a locked file for a period of five (5) years under the care of the primary investigator. After these five years

have elapsed, the printed documents collected during the investigation will be shredded and the documents stored digitally will be destroyed.

2.4. Measurement instrument

In order to estimate the integration of ICTs by Nursing students during their first year of study, the tool titled *Attitudes and Interest towards ICTs* (Morales, FM, 2012) was used after due authorization by its author. This questionnaire is divided in five parts. Part I, Internet knowledge and general usage, consists of 7 items, where students choose their answer placing an (X) in the provided space. Part II, General computer knowledge, contains five items alluding to different types of computer programs or applications. Students chose their answer placing an (X) in the corresponding space, using a scale where 0 meant no knowledge and 3 meant thorough knowledge of the corresponding program. Part III, Functions of ICTs in the university context, contains 30 items, using a scale where 1 implies complete disagreement and 5 means complete agreement with the corresponding statement.

This questionnaire is complemented by Part IV, Satisfaction with ICTs. In order to construct this section, the tool entitled Use of Social Networks in Academic Activities in the Medicine School “Luis Razetti” was used as a model (Díaz, Miguel, Landaeta, and col, 2014) after due authorization by its authors. This section seeks to measure students’ degree of satisfaction with technology, with some premises directed to theory and others to clinical practice. Part V contained the sociodemographic information.

The instrument *Attitudes and Interest towards ICTs* was used after due authorization (Morales, FM, 2012) and, for transcultural modification and adaptation, was validated in San Juan, Puerto Rico by two experts, Dr. María Aponte, Professor, while the technological area was revised by Mrs. Gladys Cora Izquierdo, a specialist in Distance Education, Technology and Compliance.

As part of the validation process, an expert validation rubric as used modelled by the *Expert Panel Rubric* by Dr. Yanilda Rodríguez. This tool was translated to Spanish and approved by the principal author.

2.5. Dependent variables:

- Integration and use of Information and communication technology, better known as ICTs. Its integration was measured through the instrument *Attitudes and Interest towards ICTs* (2012).
- Satisfaction with ICT use, as measured by *Attitudes and Interest towards ICTs* (2012). Specifically, Part IV of the questionnaire was used for this variable. It contains 12 total items including educational experiences in both theoretical courses and clinical practice of first-year students of a Nursing program.

- Academic achievement was estimated by the cumulative average of the studied population by means of a question appearing at the end of the previously mentioned questionnaire, as part of the sociodemographic information (Part V).

2.6. Independent variables:

Sociodemographic variables collected in Part V, Sociodemographic information, from the same instrument, *Attitudes and Interest towards ICTs* (2012), which included:

- Gender: Qualitative, nominal, dichotomous (female/male).
- Civil status: Qualitative, nominal, dichotomous (single/married).
- Age: 18 to 25, 26 to 30, 31 to 36 and 36 or older.
- Study program: Qualitative, nominal, dichotomous (BSN– Bachelor’s/ADN – Associate’s Degree).
- Socioeconomic profile: Qualitative, nominal, polychotomous (lower class/middle class/higher class).
- Area of residence: Qualitative, nominal, dichotomous (Rural/Urban).
- Work: Qualitative, nominal, polychotomous (yes, full-time job/yes, part-time job/no job).
- Children: Qualitative, dichotomous (yes/no).
- Program in which you acquired 12th grade diploma or equivalent: Qualitative, nominal, polychotomous (public school general program/public school commerce program/public school vocational program/12th grade equivalence test/private school/homeschooling).

2.7. Research procedure

Before receiving the approval of the Institutional Review Board of the Ana G. Méndez University System (SUAGM), San Juan, Puerto Rico, the researcher obtained the Confidentiality and Privacy, Responsible Conduct of Research, Institutional Review Board and Health Insurance Portability and Accountability Act certificates. These tests are required by the Ana G. Méndez System and its Compliance Office when employees, visitors or enrolled students from any of its educational institutions are to be used for human research purposes. In this case, to carry out the study in the private university, the researcher obtained the SUAGM IRB certificate to submit her investigation with the objective of safeguarding the subjects’ privacy and to guarantee confidentiality and secure management of the information related to the investigation. The researcher also met with the Dean of the Health Sciences Faculty to obtain approval for the study. Authorization was also requested and obtained by the Vice chancellor to carry out the investigation. Once authorization by the SUAGM IRB was obtained, the primary investigator met with the Directorate of the Nursing Program, who provided the list of days and classrooms for first-year Nursing students. Likewise, a

meeting was coordinated with faculty members to notify which courses had been selected for the recruitment of first-year students.

In this meeting, the investigation and its purpose was presented to Nursing faculty members. The professors were told which of the courses had been selected. The researcher then coordinated the date and time of her visit to the classroom directly with the professor of each Nursing section.

2.8. Data analysis

The statistical analysis was descriptive, using central tendency and dispersion measurements for quantitative variables and frequencies and percentages for qualitative variables. The possible correlation between degree of satisfaction and achievement with the integration of ICTs was identified. Similarly, an inferential analysis was carried out with Chi squared measurements for quantitative variables. In order to identify possible confounding variables, a multivariate analysis was carried out. SPSS 20 was used for data entry and analysis. This allowed for the results to be evaluated with greater ease and precision. To determine whether there is a relationship between satisfaction and use of ICTs in an educational context and academic performance by students, contingency tables and the Pearson χ^2 statistical test was used for categorical variables.

3. Results

The results of the statistical study as per the purpose of the investigation, to investigate the satisfaction of first-year Nursing students in a private university as regards Information and communications technology (ICT) and its relationship to academic achievement, are hereby presented. Studies comparative to this investigation were used as a reference for the explanation of the obtained results. The results were interpreted as per the corresponding measurement scales. It is important to emphasize that this investigation contains three different measurement scales which take into account computer knowledge, degree of satisfaction with ICTs in an educational context and degree of satisfaction with ICTs in Nursing classes. Each measurement scale was developed specifically for the variable measured, so each one of them is particular. Before evaluating each objective, the corresponding measurement scale will be reviewed. The reliability coefficient for the instrument will be presented first.

3.1. Reliability coefficient for the instrument (pilot test)

In order to measure the reliability of the data collection instrument, the Cronbach's Alpha coefficient was obtained. Cronbach's Alpha is used to determine the internal consistency of the test. To determine reliability, this coefficient uses values between 0 and 1, where 0 indicates no reliability and

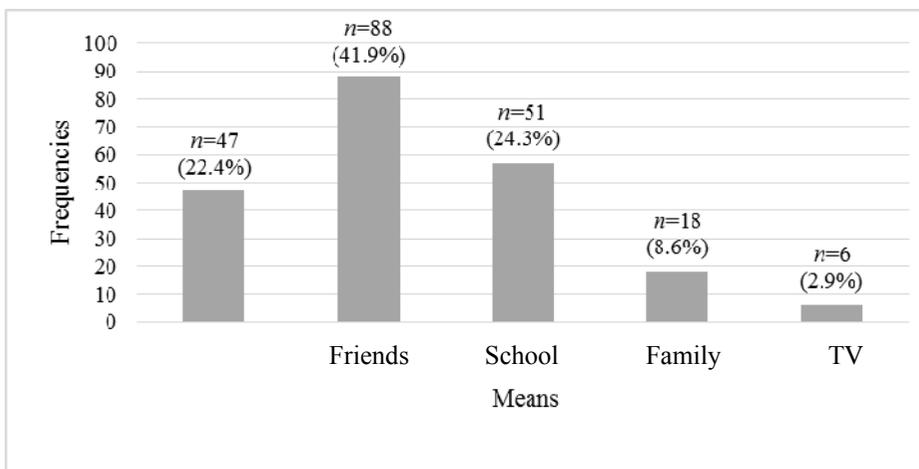


Figure 1. *Distribution of students by means through which he/she became familiarized with the Internet.*

99.9% of students indicated having some type of electronic device (computer, tablet, smart phone). The remaining 1% indicated not having any (figure 2).

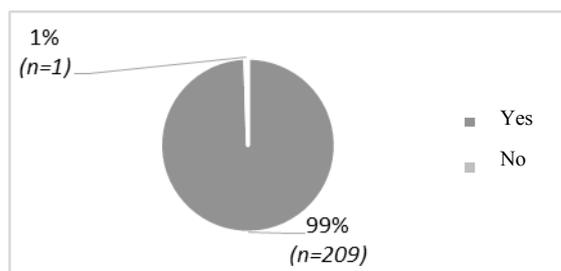


Figure 2. *Percentage distribution of students who have some type of electronic device.*

As regards the place where the student regularly uses the Internet, as seen in graph 3, 74.8% of students mentioned their house. 13% indicated connecting from their institution/university and 11% from other places, in this case from their cell phones. The lowest number was seen for the workplace (0.5%) and 1% of students did not answer.

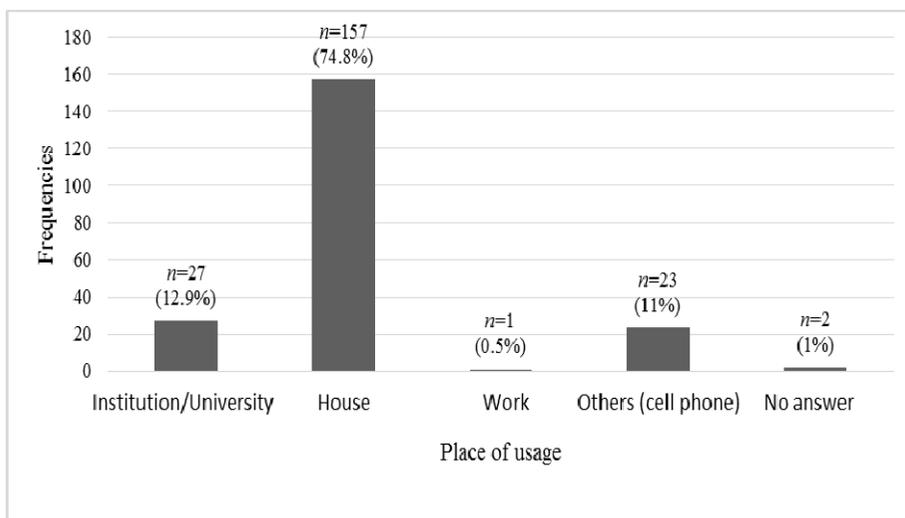


Figure 3. *Distribution of students by places from which he/she regularly uses the Internet.*

As regards daily use of the Internet, as seen in graph 4, 57.4% of students indicated using the Internet more than 10 times a day. 18.7% used the Internet between 4-6 times, 14.4% between 7-9 times a day. The lowest number was seen in the following categories: between 1-3 times (7.7%), no daily use (1.9%) and 0.5% of students did not answer.

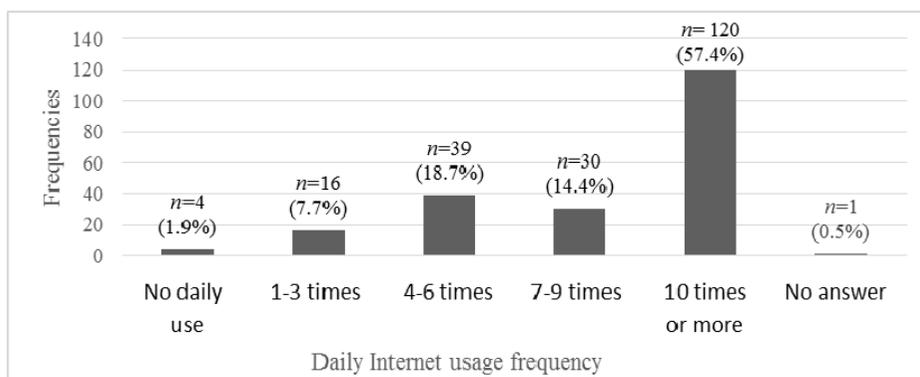


Figure 4. *Distribution of students by daily Internet usage frequency.*

As shown in graph 5, the participants mentioned social networking (40.9%) as the most frequently used online services 35.6% indicated frequent Internet usage for more than one service (e-mails, chat, forums, search engines, social networks). The lowest numbers were seen for chat use (7.2%), search engines and e-mails (6.3% each) and 3.8% who reported using other

services, means of communication or applications, while 1% of students did not answer.

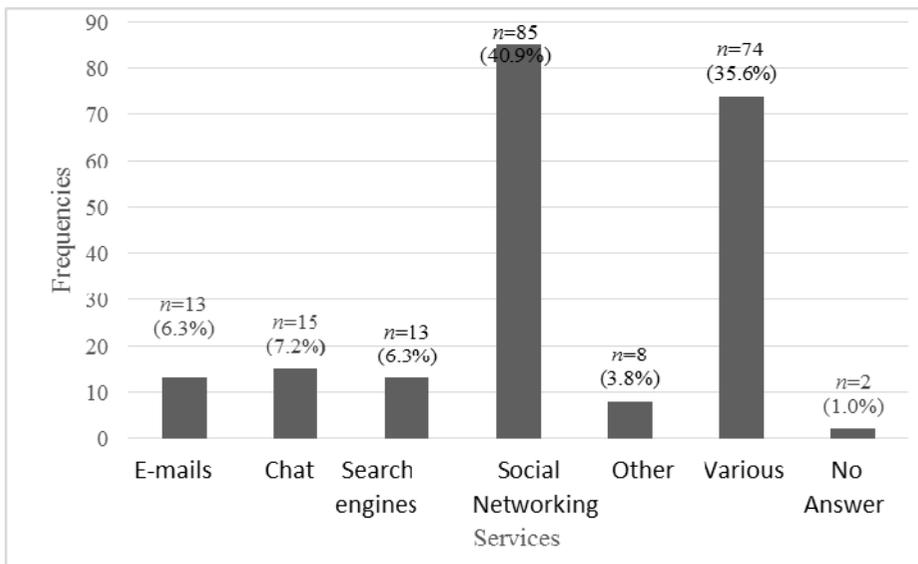


Figure 5. *Distribution of students by most frequently used Internet services.*

98.1% of students indicated that the Internet could be used as a resource within the classroom, 0.5% said it couldn't be used as a resource, and 1.4% did not answer, as can be seen in graph 6.

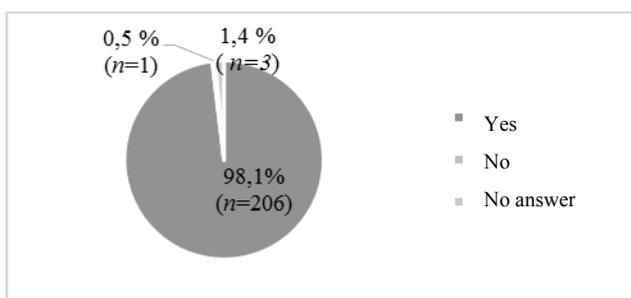


Figure 6. *Distribution of students by consideration of the Internet as a potential resource in the classroom.*

On the other hand, participants' level of knowledge of computers as regards programs and applications was also measured. As per the results shown in table 2, 90.5% of students ($n=190$) indicated having a high amount of knowledge of the Internet. 81.8% ($n=171$) indicated having a high amount of knowledge of presentations. 67.6% ($n=142$) indicated having a high amount

of knowledge of word processors. On the other hand, students indicated having little knowledge (37.1%; $n=78$) with spreadsheets. As regards databases, students indicated having little to no knowledge (39.6%; $n=80$, 31.2%; $n=63$, respectively).

Computer Programs/Applications	Level of knowledge								N	Don't know/No answer
	None (0)		Little (1)		Sufficient (2)		High (3)			
	F	%	F	%	F	%	F	%		
Word Processors			8	3.8	60	28.6	142	67.6	210	
Databases	63	31.2	80	39.6	37	18.3	22	10.9	202	8
Spreadsheets	18	8.6	78	37.1	58	27.6	56	26.7	210	
Presentations			4	1.9	34	16.3	171	81.8	209	1
Internet	1	.5	1	.5	18	8.6	190	90.5	210	

Table 2: Frequency distribution of students' knowledge of computer programs or computer applications.

As can be seen in table 3, the highest levels of knowledge were seen for the Internet (2.89), presentations (2.80) and word processors (2.64). According to the classification scale, this indicates a good amount of knowledge. On the other hand, the lowest numbers were seen for spreadsheets (1.72), classified as a sufficient amount of knowledge, and databases (1.09), classified as a low level of knowledge.

Computer Programs/Applications	Average	Median	Mode	Standard deviation	Level of Knowledge
Databases	1.09	1	1	.963	Little
Spreadsheets	1.72	2	2	.963	Enough
Word Processors	2.64	3	3	.556	High
Presentations	2.80	3	3	.477	High
Internet	2.89	3	3	.369	High

Table 3: Descriptive analysis of the students' knowledge of computer programs or applications.

Establish the degree of student satisfaction as regards ICTs in an educational context.

For the presentation and interpretation of the results in this section, the student satisfaction scale as regards the use of ICTs in an educational context will be used: Completely agree (5), Agree (4), Neither agree nor disagree (3), Disagree (2) and Completely disagree (1). In order to simplify the presentation of frequency results, the categories were considered in the following manner: Agree (completely agree and agree) and disagree (completely disagree and disagree). The third category, neither agree nor disagree, remained as is. The following interval was established for the interpretation of central

tendency measures: Agree (5.00-3.50), Neither agree nor disagree (3.49-2.50) and Disagree (2.49-1.00).

Moreover, to facilitate and structure the interpretation, the construct statements were classified in the following three areas: use of ICTs in an educational context; use of ICTs in interpersonal relationships; and use of ICTs and socioeconomic factors.

Most of the students agreed with the statements measuring satisfaction with ICTs in the educational context. The highest numbers were seen for students who consider that the Internet can be used as a teaching tool (91%), that the Internet favors the use of other languages (91%), that Internet videos can be very useful to acquire new knowledge, procedures and attitudes (87%), that movies with an educational basis (movie forums) are interesting pedagogical resources which motivate and facilitate active learning (84%) and that the Internet can be integrated to the professor's explanations using the whiteboard (83%), among other statements with lower percentages than those previously mentioned. On the other hand, a considerable amount of uncertainty was seen for the statement that positive values are transmitted through the Internet, with 51% of students choosing neither to agree nor disagree. 76% of the students disagreed with the statement that only highly intelligent students could use the Internet.

As regards the use of ICTs and interpersonal relationships in the educational context, table 5 shows students' disagreement with the statement that the Internet can replace the professor's function (65%, $n=135$). 83% of students expressed agreement with the statement that the Internet can be integrated to the professor's explanations using the whiteboard. This is an implication of the professor's importance guiding the teaching process in the classroom. Meanwhile, 59% of students expressed agreement with the statement that the Internet helps improve the relationship between members of the university and 75% agreed that the Internet can help you find new friends. The use of ICTs allows and promotes diverse interpersonal relationships in an educational setting. In keeping with this, approximately 70% of the students either disagreed or did not agree or disagree with the statement that the Internet jeopardizes the relationship between students as well as the student/teacher relationship.

Use of ICTs and interpersonal relationships in an educational setting	Disagree		Neither agree nor disagree		Agree		N	Don't know/no
	F	%	F	%	F	%		
The Internet can replace the professor's function.	135	65%	54	26%	20	10%	209	1
The Internet helps improve the relationship between members of the university.	26	13%	59	28%	123	59%	208	2

The Internet jeopardizes the student/teacher relationship.	71	34%	76	37%	61	29%	208	2
The Internet jeopardizes the relationship between students.	81	39%	77	37%	48	23%	206	4
The Internet can help you find new friends.	9	4%	44	21%	155	75%	208	2

Table 4: *Frequency distribution of students' satisfaction as regards the use of ICTs and interpersonal relationships in an educational context.*

The results presented in table 6 show that 68% of students disagree with the statement that the Internet can only be used in socioeconomically favored/advantaged/urban/rich/affluent areas. However, 42% agreed that a family's socioeconomic status facilitates access to the Internet, and 38% neither agreed nor disagreed with the statement.

Use of ICTs and socioeconomic factors	Disagree		Neither agree nor disagree		Agree		N	Don't know/No
	F	%	F	%	F	%		
The Internet can only be used in socioeconomically favored/advantaged/urban/rich/affluent areas.	139	68%	40	20%	26	13%	205	5
A family's socioeconomic status facilitates access to the Internet.	42	20%	77	38%	86	42%	205	5

Table 5: *Frequency distribution of students' satisfaction as regards the use of ICTs and socioeconomic factors.*

3.3 Determine whether there is a correlation between ICTs in an educational setting and students' academic achievement.

In order to determine whether there was a relationship between satisfaction and use of ICTs in an educational context and students' academic achievement, contingency tables and Pearson's χ^2 test were used for categorical variables. In the table, a summary of the answers obtained as relates to degree of satisfaction with the use of ICTs in an educational setting (disagree, neither agree nor disagree) is presented and compared to students' grade point average at the moment of the investigation. The results obtained were tested to determine whether there was a correlation between satisfaction and use of ICTs in an educational setting and students' academic achievement. The contingency table was used to register and analyze the relationship between two or more categorical variables, in this case two ordinal variables. The table shows that the proportion of observed values (O values) for levels of satisfaction with the use of ICTs were distributed differently according to grade point

average. To identify the statistical significance between the categorical values, the expected values (E values) were calculated for evaluation using Pearson's χ^2 test.

Degree of satisfaction with the use of ICTs		3.50 or more	3.49-2.50	2.49 or less	Total
Agree	O values	39	71	11	121
	E values	38.3	71.7	10.9	121.0
	Percentage	61.9%	60.2%	61.1%	60.8%
Neither agree nor disagree	O values	17	36	5	58
	E values	18.4	34.4	5.2	58.0
	Percentage	27.0%	30.5%	27.8%	29.1%
Disagree	O values	7	11	2	20
	E values	6.3	11.9	1.81	20.0
	Percentage	11.1%	9.3%	11.1%	10.1%
Total	O values	63	118	18	199
	E values	63.0	118.0	18.0	199.0
	Percentage	100.0%	100.0%	100.0%	100.0%

Note: O values are observed values and E values are expected values.

Table 6: Degree of students' satisfaction with the use of ICTs in an educational setting by grade point average.

The corresponding hypotheses are:

H0: There is no relationship between the degree of satisfaction with the use of ICTs in an educational setting and academic achievement.

H1: There is a relationship between the degree of satisfaction with the use of ICTs in an educational setting and academic achievement.

As can be seen in table 8, when applying the Chi squared test, the obtained p value was 0.986, greater than 0.05, the hypothesis rejection region, for which reason the null hypothesis was not rejected. Therefore, students' academic achievement is not related to satisfaction with the use of ICTs in an educational context (H0).

Therefore, the accepted hypothesis is the following:

H0: There is no relationship between the degree of satisfaction with the use of ICTs in an educational setting and academic achievement.

	Value	Df	Asymptotic significance (bilateral)
Pearson's Chi-squared	.361	4	.986
Likelihood ratio	.361	4	.986
Linear by linear association	.001	1	.977
N of valid cases	199		

Table 7: Results of Chi squared test for satisfaction with the use of ICTs in an educational context and academic achievement.

3.4. Analyze the support received by Nursing students as regards ICTs in their first year of university studies.

To determine the amount of support Nursing students receive as regards ICTs during their first year of university studies, frequencies for satisfaction with the use of ICTs in Nursing classes were obtained and contingency tables and Pearson's χ^2 test for categorical variables were used. The following table summarizes the answers obtained as relates to degree of satisfaction with the use of ICTs in Nursing classes compared with students' grade point averages at the time of questionnaire administration. These results were tested to determine whether there was a correlation between satisfaction with the use of ICTs and students' academic achievement. The contingency table was used to register and analyze the relationship between two or more categorical variables, in this case two ordinal variables. The table shows that the proportion of observed values (O values) for levels of satisfaction with the use of ICTs were distributed differently according to grade point average. To identify the statistical significance between the categorical values, the expected values (E values) were calculated for evaluation using Pearson's χ^2 test.

Initially, the results of table 8 allow us to identify that most of the students expressed satisfaction with the statements measuring satisfaction with ICTs in Nursing classes. The highest numbers for student satisfaction with the use of ICTs were seen with the statements regarding the use of PowerPoint presentations (86%) and Simulation in the Simulation Center (80%), among other statements observed to a lesser degree. However, it is important to point out that approximately 90% of students stated that they were either somewhat satisfied or satisfied with all statements measuring the use of ICTs in Nursing classes.

Statements	Degree of satisfaction with ICTs						Total	Don't know/no answer
	Dissatisfied (1)		Somewhat satisfied (2)		Satisfied (3)			
	F	%	F	%	F	%		
Searches in databases	4	2%	62	32%	129	66%	195	15
Blackboard use	15	7%	68	33%	123	60%	206	4
Virtual discussion	11	6%	94	51%	81	44%	186	24

forums								
PowerPoint presentations	2	1%	26	13%	176	86%	204	6
Prezi presentations	19	13%	53	37%	71	50%	143	67
Use of technology in theoretical classes	4	2%	51	26%	142	72%	197	13
Use of emails associated to the class or institution	4	2%	43	21%	158	77%	205	5
Use of electronic devices during class	5	2%	39	19%	158	78%	202	8
Virtual simulation	4	2%	49	28%	123	70%	176	34
Simulation in Simulation Center	4	2%	31	18%	140	80%	175	35
Exposure to electronic record	6	3%	53	31%	113	66%	172	38
Exposure to biomedical equipment	2	1%	32	20%	128	79%	162	48

Table 8: *Degree of students' satisfaction as regards the use of ICTs in Nursing classes.*

The following contingency table compares the degree of satisfaction with the use of ICTs in Nursing classes and students' grade point average at the moment of the investigation. It shows that degree of satisfaction with ICTs is spread differently according to grade point average (see observed "O" values). To identify the statistical significance between the categorical values, the expected values (E values) were calculated for evaluation using Pearson's χ^2 test.

Degree of satisfaction as regards the use of ICTs in Nursing classes		3.50 or more	3.49-2.50	2.49 or less	Total
Satisfied	O values	56	84	12	152
	E values	47.6	90.6	13.8	152.0
	Percentage	90.3%	71.2%	66.7%	76.8%
Somewhat satisfied	O values	6	34	6	46
	E values	14.4	27.4	4.2	46.0
	Percentage	9.7%	28.8%	33.3%	23.2%
Totals	O values	62	118	18	198
	E values	62.0	118.0	18.0	198.0
	Percentage	100.0%	100.0%	100.0%	100.0%

Note: O values are observed values and E values are expected values.

Table 9: *Degree of students' satisfaction as regards the use of ICTs in Nursing classes and academic achievement.*

The corresponding hypotheses are:

H0: There is no correlation between the use of ICTs in Nursing classes and students' academic achievement.

H1: There is a correlation between the use of ICTs in Nursing classes and students' academic achievement.

As can be seen in table 10, when applying the Chi squared test, the obtained *p* value was 0.009, less than 0.05, the hypothesis rejection region, for which reason the null hypothesis was rejected. Therefore, students' academic achievement is associated with satisfaction with ICTs in an educational context.

Therefore, the accepted hypothesis is the following:

H1: There is a correlation between the use of ICTs in Nursing classes and students' academic achievement.

	Value	Df	Asymptotic significance (bilateral)
Pearson's Chi-squared	9.478	2	.009
Likelihood ratio	10.609	2	.005
Linear by linear association	8.301	1	.004
N of valid cases	198		

Table 11: Results of Chi squared test for satisfaction with the use of ICTs in an educational setting and academic achievement.

Sample description

The percentage distribution by student gender (graph 7) shows that 73% of participants were women, 25% were men and 2% did not answer.

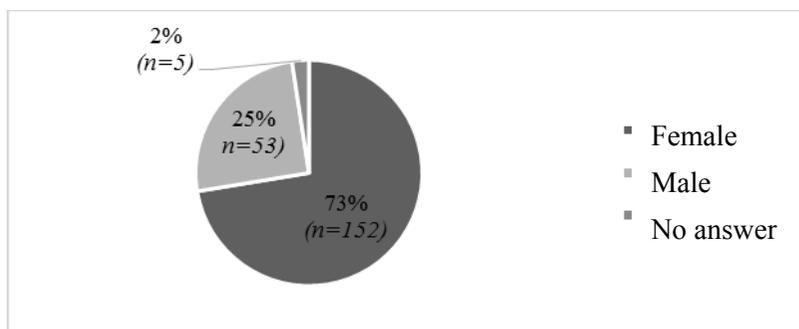


Figure 7. Percentage distribution of students by gender.

As regards the civil status of students at the moment of the investigation, as shown in graph 8, 90.5% indicated being single while 6.7% indicated being married. Only 0.5% of participants indicated another civil status and 2.4% did not answer.

As regards age groups, as shown in graph 9, 76.7% of participants indicating being between 18 and 21 years old at the moment of questionnaire administration and 13.3% between 22 and 25 years old. The lowest concentration of students was seen among those 26 years or older with 7.6%. 2.4% of students did not answer.

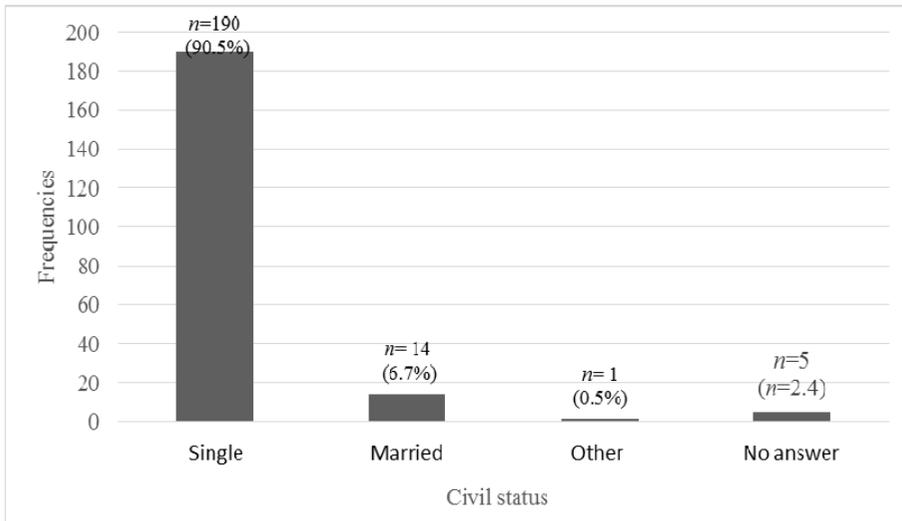


Figure 8. Distribution of students by civil status.

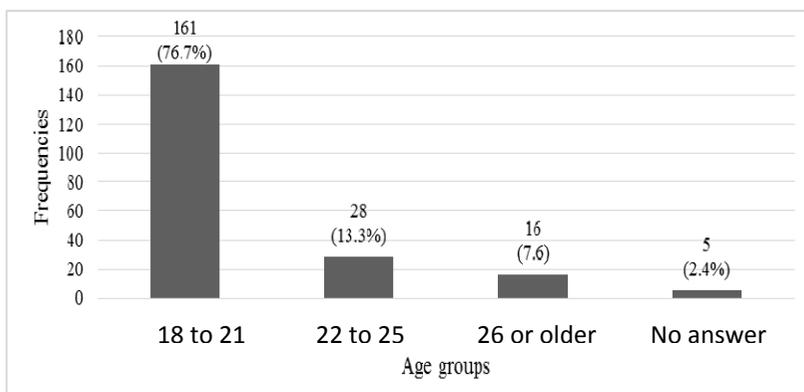


Figure 9. Distribution of students by age group.

Regarding the Nursing program in which the participants were enrolled at the time of the study (figure 10), 96.2% ($n=202$) is enrolled in a bachelor's program, 2% ($n=3$) in an associate degree program and 2.45% ($n=5$) did not answer.

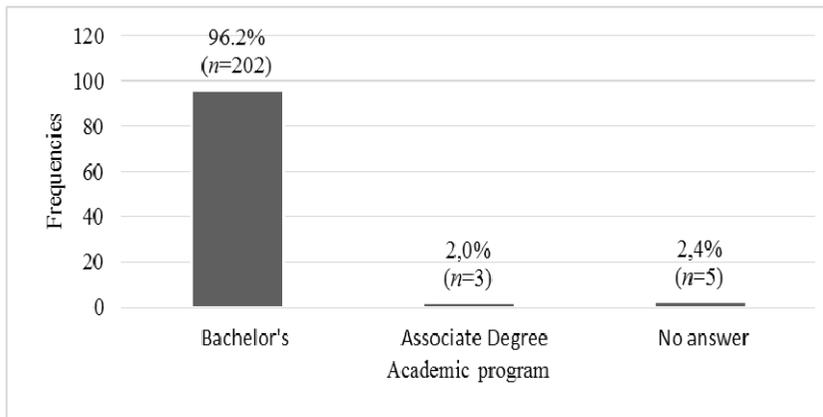


Figure 10. Percentage distribution of students by enrolled Nursing program.

81% of students indicated being in a daytime program, 16% in a nighttime program and 3% did not answer (figure 11).

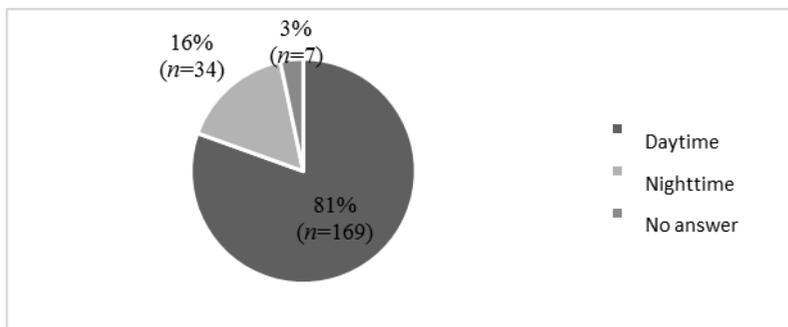


Figure 11. Percentage distribution of students by program schedule.

Regarding annual family income, as seen in graph 12, 59% of students indicated earning less than \$20,000, 21.4% between \$20,001 and \$40,000, 6.7% between \$40,001 and \$60,000, and the lowest number (2.9%) was seen for an income higher than \$60,000. 10% of participants did not answer.

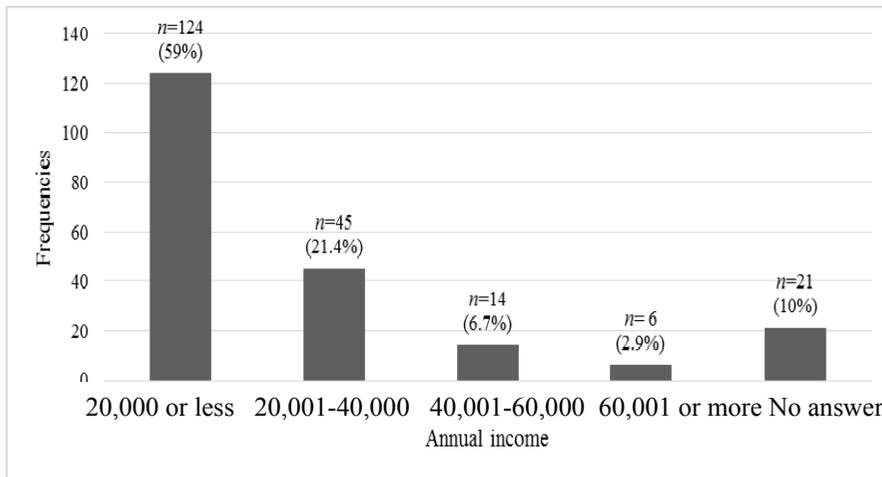


Figure 12. *Distribution of students by annual family income.*

Regarding students' place of residence, graph 13 shows that 58% came from an urban zone and 38% from a rural area. 4% of the students did not answer.

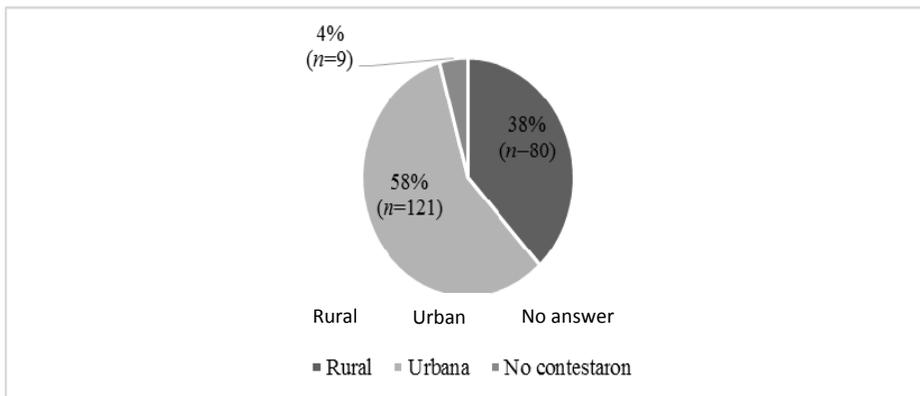


Figure 13. *Percentage distribution of students by place of residence.*

Graph 14 shows the employment status of the participants. 41.9% indicated they did not work at the time of questionnaire administration, while 40.5% had a part-time job and 12.9% had a full-time job. 4.8% of students did not answer.

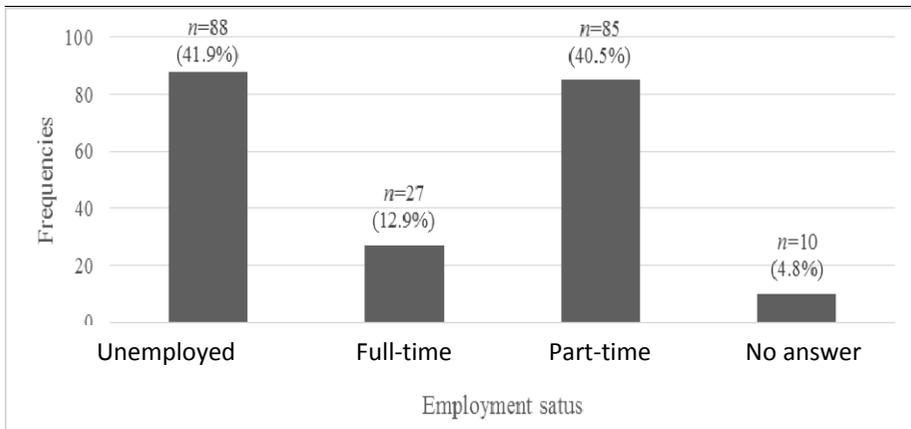


Figure 14. Percentage distribution of students by employment status.

Figure 16 shows the percentage distribution of students with and without children at the time of the investigation. 83% indicated having no children and 12% indicated having one or more child. 10% of participants did not answer.

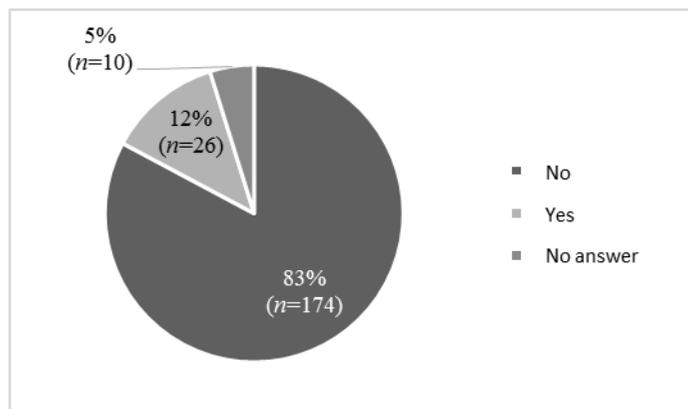


Figure 15. Percentage distribution of students with or without children.

Regarding the means by which participants acquired the 12th grade diploma, graph 17 shows that 62.4% acquired the diploma at a public school and 28.1% at a private school. The lowest numbers were seen for equivalence tests (1%), homeschooling (0.5%) and other means (1.9%). 6.2% of students did not answer.

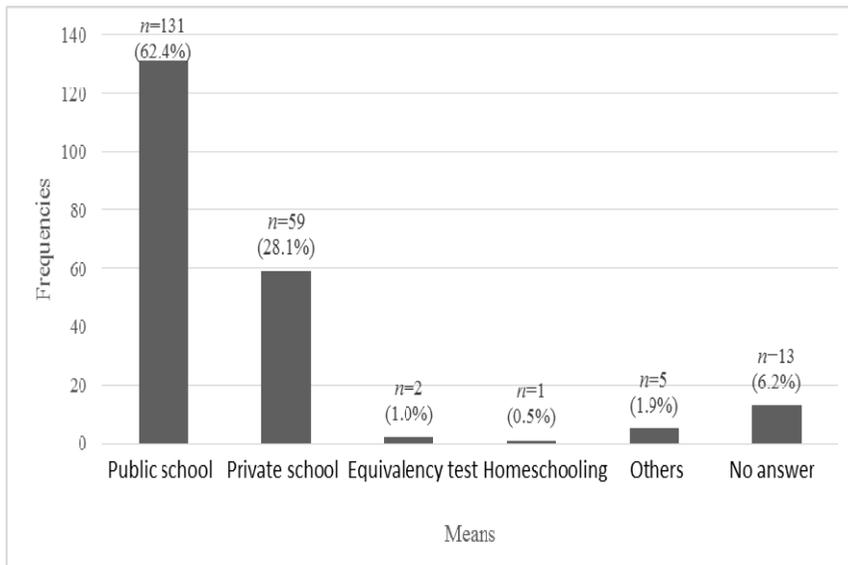


Figure 16. *Distribution of students by 12th grade diploma acquisition means.*

Figure 17 shows the distribution of students who had taken online or distance classes. 77% of students indicated they had while 18% said they had not. 5% of students did not answer.

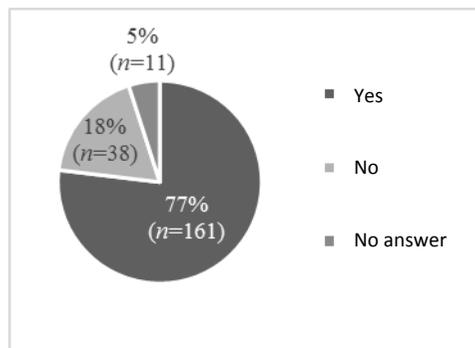


Figure 17. *Percentage distribution of students who had taken online or distance classes.*

As shown in graph 18, 87% of students indicated mastering the technical and operational language of their computer and only 7% indicated they did not. 6% of students did not answer.

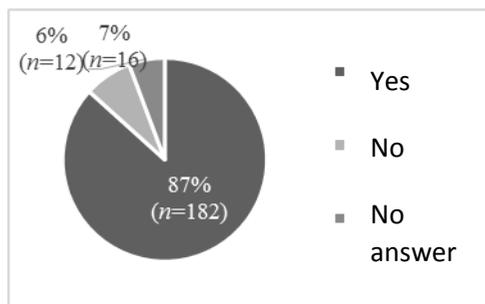


Figure 18. Percentage distribution of students who control the technical and operational language of their computer.

According to the information presented in graph 20, 56.2% of students indicated having a B average between 2.50 and 3.49. 30% indicated having an A average of 3.50 or higher. The lowest proportions were seen for C averages between 2.49 and 1.60 and D between 0.80-1.59, with 8.1% and 0.5%, respectively. 5.2% of participants did not answer.

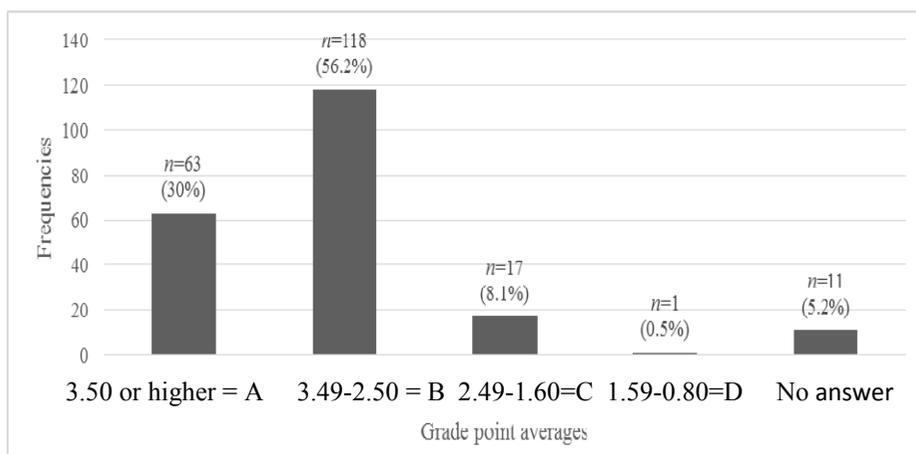


Figure 19. Distribution of students by grade point average interval.

4. Discussion and conclusions

We will continue the discussion and conclusions with regard to the objectives of our investigation. As for objective 1, identify the technological tools most often used by students, the most frequent service was Social Networks with 40.9%, followed by Various (e-mails, chats, forums, search engines and social network) with 35.6%. With regard to computer application and programs, students expressed having a high amount of knowledge of the

Internet with 90.5%, of presentations with 81.8% and with word processors with 67.6%. Students expressed having little knowledge with regard to academic databases with just 39.6%, and with spreadsheets with 37.1%. As for objective 2, establishing degree of students' satisfaction as regards ICT use, Nursing students in their first year of studies generally expressed being satisfied with the use of ICTs. Students expressed greater satisfaction with the use of ICTs in Nursing classes. The most significant data was seen with simulation centers with 80%, biomedical equipment with 79%, satisfaction with virtual simulation with 70%, followed by exposure to electronic records with 66%. Results measuring the degree of students' satisfaction as regards ICTs in an educational setting were compared. The perception of students as relates to the integration of ICTs in their general courses can be observed. Among the 22 statements, two of them reflected a significantly high percentage. 91% agreed that the Internet can be used as a teaching tool and that it favors the use of other languages.

Regarding the third objective, determine whether there is a relationship with students' academic achievement, we can see a relationship between satisfaction with ICTs in Nursing classes and students' academic achievement. 90.3% of students with a grade point average of 3.50 or higher expressed being satisfied, while 71.2% of students with an average of 2.50 to 3.49 expressed being satisfied. Generally speaking, participants had an average between 2.50 and 3.50 or higher. 56.2% had an average between 2.50 and 3.49, while 30% had an average of 3.50 or higher. As regards the percentage of participants who master the technical and operational language of their computer, 87% of participants indicated doing so, which can be associated with the amount of students who expressed satisfaction.

As regards the fourth objective, analyzing the support received by Nursing students for ICT use during first year of university studies, Nursing students enrolled in the studied university receive classes for integration into college life as well as basic classes on technical language as part of their curriculum. The studied university's goals include good use of information as part of expected competencies and results. Nursing alumni will face great challenges with technological innovation in the work field. Therefore, Nursing professionals must master the technical language in order to manage the electronic records of Puerto Rico's health system in compliance with Law Number 40 of February 2, 2012 for the Administration and Exchange of Electronic Information of Puerto Rico.

We would like to highlight that none of the sociodemographic variables presented in our investigation limited participants' ability to express their experience with ICT use. No correlation was observed in this investigation with the sociodemographic information, that is to say gender, civil status, age, annual family income, place of residence, employment status and amount of children, and degree of satisfaction with ICT use. 100% of students reported

being familiarized with the Internet. 41.9% of participants became familiarized with the Internet through school, followed by through friends with 22.4%. The studied population was able to describe their experience with ICTs in this research project.

4.1. Limitations of the study

A difficulty we solved entailed adjusting the thesis proposal to two different writing models, European and American. However, we managed to comply with the requirements of both jurisdictions.

4.2. Recommendations

We consider that our investigation should be replicated with Nursing students in their second, third and fourth year of study within the Nursing program in order to gauge the needs of these groups and compare the results with those of our investigation. Moreover, we propose the following recommendations:

- Offer training to professors as well as Nursing students on the latest tendencies of Information and communication technology (ICTs).
- Include a uniform guide in all Nursing curricula to help students and professors search for information through their institution's databases.
- Encourage evidence-based practice starting at the initial Health Science classes until culmination of the academic degree.
- Train Nursing faculty members through face-to-face workshops on the use of the most commonly used technological tools by Nursing students and how to integrate these tools in classes as part of teaching strategies.
- Establish a list of minimum skills for information and communication competencies within Nursing. This will help Nursing alumni in their immersion to the workforce, which requires a base amount of technical language know-how.
- Develop a guide for information search based on the competencies of the Nursing program for health sciences professors.

4.3. Prospective

After analyzing the findings of our study, we conclude that this investigation not only helps the studied community identify their degree of satisfaction as regards the integration of ICTs in their classes, but also contributes to the general population given that, once universities adopt the recommendations proposed in this paper, Nursing alumni will have the opportunity to acquire the necessary information competencies for their immersion into the workforce, and they will be able to easily master relevant technical language.

On the other hand, our investigation will help Nursing alumni approach current challenges within the health field and ensure patients are more informed and demanding with regard to their health conditions, becoming con-

sumers of digital information. At the level of society as a whole, this investigation contributes to ensure the community in general receives evidence-based treatment and the most up-to-date information on their treatments.

We propose future investigation of the following topics: 1. Nursing professors' degree of knowledge of ICTs as learning strategies in their classes; 2. Level of knowledge of ICTs by Nursing professionals and their degree of satisfaction with electronic record engagement; 3. Identification of the most common learning styles in different generational groups (Millennials, Generation X and Baby Boomers) within the Nursing Sciences program; and 4. Degree of adaptation of Nursing professionals as regards electronic records in a clinical setting.

References

- Adell, J. (1997). Tendencias de Investigación en la Sociedad de las Tecnologías de la Información. *Revista Electrónica de Tecnología Educativa*, 7. Retrieved from: http://nti.uji.es/docs/nti/jordi_adell_edutec.html&spf=73 asociación de clínicas,
- Sanatorios & Hospitales Privados de la República Argentina (ACSHPra). (2010). Las Enfermeras en la Vanguardia de los Cuidados de las Enfermedades Crónicas. *Visión de Enfermería Actualizada*, 6(23), 48-50.
- ASEPUR. (2012). *Historia de la Simulación en Puerto Rico*. Retrieved from http://www.asepur.org/wpcontent/uploads/2012/11/historia_simulacion_asepur.pdf
- Barraza, C.G. & Ortiz Moreira, L. (2012). Factores Relacionados a la Calidad de Vida y Satisfacción en Estudiantes de Enfermería. *Ciencia y Enfermería*, 18(3), 111. doi: 10.4067/S0717-95532012000300011
- Bell, W., & Toffler, A. (1982). The Third Wave. *Social Forces*, 61(1), 298. doi:10.2307/2578094
- Boronat, X., & Romero, M. (2012). Los Profesionales de la Salud en Europa y Estados Unidos ante la Educación Presencial y en e-Learning. *Revista Educativa en Ciencias de la Salud*, 9(1), 50-52. Retrieved from <http://www2.udec.cl/ofem/recs/anteriores/vol912012/artinv9112f.pdf>
- Boude Figueredo, O., & Medina Rivilla, A. (2011). Desarrollo de Competencias a través de un Ambiente de Aprendizaje Mediado por TIC en Educación Superior. *Educación Médica Superior*, 25(3), 301-311. Retrieved from: <https://doaj.org/article/64104fde21b745ed8fc0cb2458458378>

- Boude Figueredo, O. R., & Ruiz Quintero, M. (2008). Las TIC: Propuesta para el Aprendizaje de Enfermería Basada en Problemas. *Aquichan*, 8(2), 227-242.
- Browne, B. A., Kaldenberg, D. O., Browne, W. G. & Brown, D. J. (1998). Student as Customer: Factors Affecting Satisfaction and Assessments of Institutional Quality. *Journal of Marketing for Higher Education*, 8(3), 1-14. Retrieved from:
http://www.tandfonline.com/doi/abs/10.1300/J050v08n03_01
- Button, D., Harrington, A. & Belan, I. (2014). E-learning & Information Communication Technology (ICT) in Nursing Education: A Review of the Literature. *Nurse Education Today*, 34(10), 1311-1323. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/23786869>
- Cabero, J., Martínez, F. & Salinas, J. (2003). *Medios y Herramientas de Comunicación para la Educación Universitaria EDUTEC*. Retrieved from <http://gte.uib.es/pape/gte/publicaciones/medios-y-herramientas-de-comunicacion-para-la-educacion-universitaria>
- Calderón, T. (2013). *Tecnologías de la Información y Comunicación*. Retrieved from <http://nursetics.blogspot.com/2013/04/por-que-utilizar-los-tics-en-enfermeria.html>
- Chen, H., Farmer, S., Barber, L. & Wayman, M. (2012). Development and Psychometric Testing of the Nursing Student Satisfaction Scale. *Nursing Education Perspectives*, 33(6), 369. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/23346783>
- Choque Larrauri, R. (2011). Las Nuevas Competencias TIC en el Personal de los Servicios de Salud. *Revista de Comunicación y Salud: RCyS*, 1(2), 47-60. Retrieved from:
<http://dialnet.unirioja.es/servlet/oaiart?codigo=3817721>
- Contreras, P. A., Mora González, B., & Metaute Paniagua, P. M. (2015). El Rol del Estudiante en los Ambientes Educativos Mediados por las TIC. *Revista Lasallista de Investigación*, 12(2), 132-138.
- Díaz González, M. (2013). *Nivel de Satisfacción de los Estudiantes de Enfermería sobre la Enseñanza en la Asignatura Enfermería en Salud del Adulto y Anciano de la E.A.P.E. de la UNMSM*. Lima, Perú: Universidad Nacional Mayor de San Marcos. Retrieved from:
http://cybertesis.unmsm.edu.pe/bitstream/cybertesis/3530/1/diaz_gm.pdf
- Díaz, K., Miguel, V., Landaeta, I., Ortiz, M., & Fernández, M. (2014). Satisfacción Estudiantil con el Uso de Estrategias Instruccionales Apoyadas en TIC para el Aprendizaje de Bioquímica. *Docencia Universitaria*, 15(2), 11-21. Retrieved from:
https://www.researchgate.net/publication/277403554_Satisfaccion_estudiantil_con_el_uso_de_estrategias_instruccionales_apoyadas_en_TIC_para_el_aprendizaje_de_bioquimica

- Díaz, L. B. (2009). La Integración de las Tecnologías de la Información y las Comunicaciones al Currículo Regular. *Eduka*, 27, 11-21. doi://unesdoc.unesco.org/images/0015/001507/150785s.pdf
- Duart, J., Gil, M., Pujol, M. & Castaño, J. (2009). La Universidad en la Sociedad Red. *Revista de la Educación Superior*, 3(151), 181-184. Retrieved from: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S018527602009000300011
- Elliott, K. M., & Healy, M. A. (2001). Key Factors Influencing Student Satisfaction Related to Recruitment and Retention. *Journal of Marketing for Higher Education*, 10(4), 1-11. Retrieved from http://www.tandfonline.com/doi/abs/10.1300/J050v10n04_01
- Elliott, K. M., & Shin, D. (2002). Student Satisfaction: An Alternative Approach to Assessing this Important Concept. *Journal of Higher Education Policy and Management*, 24(2), 197-209. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/1360080022000013518>
- Espínola López, C. N., Ojeda Delgado, C. C., Ramos Ramírez, A. L., & Robertti Pereira, A. (2011). *Conocimientos, Prácticas y Actitudes acerca de las TICs en la Población de Profesionales Enfermeros del Sector Público y del Instituto de Previsión Social (IPS) del Alto Paraná*. Alto Paraná, Paraguay: Universidad Nacional del Este. Retrieved from <http://www.arnaldomartinez.net/enfermeria/articulo17.pdf>
- Fernández, A. (2010). *TIC y Salud: Promesas y Desafíos para la Inclusión Social*. Retrieved from <http://www.cepal.org/socinfo/noticias/paginas/3/44733/newsletter12.pdf>
- Fortuño, M. L., Gisbert-Cervera, M., Marqués-Molíás, L., Vidal, C. E., Martínez, J. G., & Riobóo, N. A. (2013). Tutoría Virtual para Profesionales de Enfermería Noveles. *RIED: Revista Iberoamericana de Educación a Distancia*, 16(1), 199-215. Retrieved from <http://eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?sid=d54f2f7d-d8a3-4409-bfbc-53e2911b4f68%40sessionmgr4008&vid=16&hid=4110>
- García Martínez, M. (2011). *Competencia Informacional de los Estudiantes de Enfermería del Campus Terres de l'Ebre para Buscar y Seleccionar Información Académica en Internet Universitat Rovira i Virgili*. Retrieved from <http://hdl.handle.net/10803/8952>
- García, C. (2009). *Las TIC y la Discapacidad*. Retrieved from <http://discapacitat-es.blogspot.com/2009/09/el-blog-las-tic-y-la-discapacidad.html>
- González Hernando, C. (2012). *Aplicación del “Aprendizaje Basado en Problemas” en los Estudios de Grado en Enfermería*. (Dissertation). Universidad de Valladolid: España. Retrieved from <https://uvadoc.uva.es/bitstream/10324/2932/1/TESIS332-130606.pdf>

- González Ortega, Y. (2010). La Tecnología de la Información y Comunicación como Nueva Forma de Estrategia en Enfermería ENEO-UNAM. *Revista Enfermería Universitaria*, 7(4), 4-5. Retrieved from <http://www.medigraphic.com/pdfs/enfuni/eu-2010/eu104a.pdf>
- González Vázquez, J. R. (2012). *La Estrategia Universitaria para las TIC: Necesidades, Oportunidades y Cambio. Investigación Universitaria Universidad Santiago de Cuba*. Retrieved from <http://www.monografias.com/trabajos92/estrategia-universitaria-tic-necesidades/estrategia-universitaria-tic-necesidades2.shtml>
- Godshall, M. (2016). *Fast Facts for Evidence-Based Practice in Nursing, Second Edition: Implementing EBP in a Nutshell*. New York: Springer Publishing Company.
- Grossman, R. P. (1999). Relational versus Discrete Exchanges: The Role of Trust and Commitment in Determining Customer Satisfaction. *The Journal of Marketing Management*, 9(2), 47-58.
- Guerra Martín, M. D., Serrano, M. L., Domínguez, E., & Lima Rodríguez, J. (2014). Is Information Literacy Learning Effective for Nursing Students? / ¿Es Efectivo el Aprendizaje sobre Alfabetización en Información para Estudiantes de Enfermería? *Enfermería Global*, 13(4), 103. Retrieved from <http://search.proquest.com/docview/1664929244>
- Guzmán, J. (2011). La Calidad de la Enseñanza en Educación Superior ¿Qué es una Buena Enseñanza en este Nivel Educativo? *Perfiles Educativos*, 33, 129-141. Retrieved from <https://doaj.org/article/a831725812264502bf1904647c42b63d>
- Hernández Cortina, A., Wigodski Sirebrenik, J. & Caballero Muñoz, E. (2012). Informática en Enfermería: Un Desafío a la Formación Actual. *Medwave*, 12(2): e5307. doi: 10.5867/medwave.20012.02.5307
- Hernández Falcón, J. (2013). *Puerto Rico: Más Digital que Nunca*. Retrieved from <http://www.primerahora.com/tecnologia/blog/jose-hernandez-falcon/posts/puertoricomasdigitalquenunca-1009793/>
- Hovenga, J.S. (2010). *Health Informatics: An Overview*. Amsterdam: IOS Press.
- Huamani-Navarro, M., Alegría-Delgado, D., López-Sánchez, M., Tarqui-Mamani, C. B., & Ormeño-Caisafana, L. (2011). Conocimientos, Prácticas y Habilidades sobre la Búsqueda Bibliográfica y Percepción Estudiantil sobre la Capacitación Universitaria en Investigación, en Estudiantes de Obstetricia. *Educación Médica*, 14(4), 235-240. doi: 10.4321/S1575-18132011000400007
- Krishnaveni, D. R., & Meenakumari, J. (2010). Usage of ICT for Information Administration in Higher Education Institutions – A Study.

- International Journal of Environmental Science and Development*, 1(3), 282-286. doi:10.7763/IJESD. 2010.V1.55
- Laine, L. (2003). Is e-Learning Effective for IT Training? *Talent Development*, 57(6), 55-60.
- Ley Núm. 254 del año 2015. *Ley para Regular la Práctica de la Enfermería en Puerto Rico* (diciembre 31, 2015).
- Lleixà Fortuño, M. (2013). *Competencias Básicas TIC y Estudiantes de Enfermería*. Retrieved from <http://www.agoradenfermeria.eu/CAST/num008/inferm.html>
- López de la Madrid, MC. (2013). Impacto de las Tecnologías de la Información y la Comunicación (TIC) en el Docente Universitario: el Caso de la Universidad de Guadalajara. *Perspectiva Educacional*, 52(2), 4-34. Retrieved from <http://dialnet.unirioja.es/servlet/oiari?codigo=4365212>
- López Yustos, A. (2007). *Compendio Historia y Filosofía de la Educación*. San Juan, P.R.: Publicaciones Puertorriqueñas Editores.
- López Yustos, A. (2006). *Sociedad y escuela en Puerto Rico*. Hato Rey, P.R.: Publicaciones Puertorriqueñas.
- Lorente Gallego, A. M., García Sánchez, C., López Arroyo, M. J., Echevarría Pérez, P. & Morales Moreno, I. (2009). Satisfacción de los Alumnos de Enfermería de la Universidad Católica San Antonio (UCAM) sobre su Formación Práctica: Seminarios en Salas de Demostraciones y Prácticas Clínicas. *Enfermería Global*, 17, 13-15.
- Lundstrom, W. J., & Hunt, H. K. (1978). Conceptualization and Measurement of Consumer Satisfaction and Dissatisfaction. *Journal of Marketing Research*, 15(1), 167. doi:10.2307/3150428
- Luperón de Armas, Y C, & Montenegro Arias, L. (2008). El Uso de las TIC en la Carrera de Enfermería. *Revista Electrónica de las Ciencias Médicas en Cienfuegos*, 15(43). Retrieved from <http://odiseo.com.mx/node/142>
- Markus, L., & Robey, D. (2009). TIC y Cambios Organizativos. *Management Science*, 34(5), 583-598.
- Mifsud Talón, E. (n.d.). Buenas Prácticas TIC. *Valencia: Generalitat Valenciana*. Retrieved from https://issuu.com/eslibre.com/docs/buenas_pr_cticas_tic
- Morales Gil, I. (2014). ¿Qué Cambio han Supuesto las TIC en la Enseñanza Universitaria de Enfermería? *Revista Cuidándote digital*, 7(3), 1-4.
- Morales Rodríguez, F. (2012). Actitudes e Intereses hacia las TIC en una Muestra de Estudiantes de Posgrado. *Psicología Educativa*, 18(1), 52-63. doi://dx.doi.org/10.5093/ed2012a9
- Morín, J. & Seurat, R. (1998). *Gestión de los Recursos Tecnológicos*. Clásicos COTEC 3. Madrid: Fundación COTEC para la Innovación Tecnológica.

- Moya Martínez, M., Hernández Bravo, J., Hernández Bravo, J., & Cózar Gutiérrez, R. (2011). Análisis de los Estilos de Aprendizaje y las TIC en la Formación Personal del Alumnado Universitario a través del Cuestionario REATIC. *Revista de Investigación Educativa*, 29(1), 137-156. Retrieved from <http://revistas.um.es/rie/article/view/110481>
- Muñoz Ortiz, M. (2014). *Fiabilidad del Instrumento Institucional de Avalúo del Aprendizaje*. San Juan: Universidad Metropolitana. Oficina de Planificación y Avalúo Institucional.
- Orellana Yañez, A. & Paravic Klijn, T. (2007). Enfermería Basada en Evidencia, Barreras y Estrategias para su Implementación. *Ciencia y Enfermería* 13(1): 17-24.
- Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based Virtual Learning Environments: A Research Framework and a Preliminary Assessment of Effectiveness in Basic IT Skills Training. *MIS Quarterly*, 25(4), 401-426. Retrieved from <http://www.jstor.org/stable/3250989>
- Piscitelli, A. (2012). *Las TIC No son una Caja de Herramientas, son una Nueva Cultura*. Red Latinoamericana Portales Educativos (Relpe). Retrieved from <http://www.relpe.org/especial-del-mes/las-tic-no-son-una->
- Quintero, A. (2009). *Breve Historia de la Educación en Puerto Rico*. Retrieved from <http://www.encyclopediapr.org/esp/article.cfm?ref=06081401&page=1>
- Ramírez, I. (2010). *La Educación Superior en Puerto Rico durante la Época Colonial Española*. Retrieved from: http://www.unesco.org/ve/index.php?option=com_content&view=article&id=2558%3Ala-educación-superior-en-puerto-rico-durante-la-época-colonial-espanola
- Rexach, V., Gabriela A. & Asinsten J.C. (2003). *Manual de informática educativa para educación infantil. Hay un mouse en mi jardín*. Buenos Aires: Ediciones Novedades Educativas.
- Rivera Cruz, Y. (2013, May, 17). Internet Desafía la Recesión en Puerto Rico. *El Nuevo Día*. Retrieved from <http://www.elnuevodia.com/Internetdesafialarecesionenpuertorico-1513382.html>
- Robles, V. (2013). La Educación Presencial, a Distancia y el Uso de las TIC en Puerto Rico y República Dominicana. *HETS Online Journal*, 4(1), 58. Retrieved from <http://www.hets.org/journal/articles/96-la-educacion-presencial-a-distancia-y-el-uso-de-las-tic-en-puerto-rico-y-republica-dominicana>
- Rodríguez Ezquerdo, L. (2009). *Resistencia al Uso de la Tecnología en la Sala de Clase*. Retrieved from <https://comparteconmigo.wordpress.com/2009/09/21/resistencia-al-uso-de-la-tecnologia-en-la-sala-de-clase/>

- Rodríguez Izquierdo, R.M. (2011). Repensar la Relación entre las TIC y la Enseñanza Universitaria: Problemas y Soluciones. *Profesorado*, 15(1), 9-22.
- Rozas, M. R., Costa, J., Francés, L., Viñas, H., Paulí, A. & Martínez, C. (2008). Autoevaluación del Aprendizaje en Enfermería con Ejercicios Interactivos del Programa Hot Potatoes Self-Evaluation of Nursing Learning with Hot Potatoes Interactive Exercises. *Educación Médica*, 11(1), 19-27.
- Salinas Gutiérrez, A. & Martínez Cambor, P. (2007). Principales Factores de Satisfacción entre los Estudiantes Universitarios. *Revista Internacional de Ciencias Sociales y Humanidades, SOCIOTAM*, 17(1), 163-192.
- San Segundo, S. P., García-Valcárcel Muñoz-Repiso, A., & Tejedor Tejedor, F. J. (2009). Medida de Actitudes del Profesorado Universitario hacia la Integración de las TIC a Scale for the Measurement of University Teachers' Attitudes Towards the Integration of ICT. *Comunicar*, (33), 115-124.
- Sánchez García, A. B., Carillo De Gea, J M, & Fernández Alemán, J. (2011). Evaluación de la Calidad de un Sistema de Aprendizaje de Enfermería Basado en Computador. *Revista de Salud*, 7(25) Retrieved from <http://dialnet.unirioja.es/servlet/oaiart?codigo=3407837>
- Sangrá, A. (2004). *La Transformación de las Universidades a través de las TIC: Discursos y Prácticas*. Barcelona: Editorial U.O.C.
- Suhre, C., Jasen, E., & Harskamp, E. (2007). Impact of Degree Program Satisfaction on the Persistence of College Students. *Higher Education*, 54(2), 207-226. doi:10.1007/s10734-005-2376-5
- Sun, P., Tsai, R. J., Finger, G., Chen, Y., & Yeh, D. (2008). What Drives a Successful e-Learning? An Empirical Investigation of the Critical Factors Influencing Learner Satisfaction. *Computers & Education*, 50(4), 1183-1202. doi: 10.1016/j.compedu.2006.11.007
- Tejada Domínguez, F. J., & Ruiz Domínguez, M del R. (2010). Aplicaciones de Enfermería Basadas en TIC's: Hacia un Nuevo Modelo de Gestión. *ENE Revista de Enfermería*, (4), 10-18. Retrieved from <http://dialnet.unirioja.es/servlet/oaiart?codigo=3312462>
- Thede, L. Q., & Sewell, J. (2013). *Informatics and Nursing: Opportunities and Challenges*. Philadelphia: Lippincott Williams & Wilkins
- Tjørve, A. K., Sutterud, E., Midtskogen, B., Krüger, A. F., Fulton, N., & Ellefsen, S. (2010). The Use of Technology in Teaching: Student Satisfaction and Perceived Learning. *Uniped Årgang*, 33(3), 63-72.
- Toffler, A. (1979). *The Third Wave*. New York: Bentam Books.
- Toro, U., & Millind, J. (2012). Use ICT in Universities. *International Journal of Innovation*, 3(1), 20-23.

- Tovar, M. C., Argote, L.A., & Ocampo, MV. (2011). Las TIC en la Escuela de Enfermería de la Universidad del Valle: Una Experiencia Transformadora. *Colombia Médica*, 42(2), 134-143.
- UMET. (2016). *Historia de la Universidad Metropolitana - UMET*. Retrieved from umet.suagm.edu: <http://umet.suagm.edu/historia>
- UMET. Registraduría. (2016, 03 04). *Datos de Matrícula. Segundo Semestre (2015-2016)*. San Juan: UMET.
- Universidad Metropolitana. (2012). *Manual de Estudiantes de Enfermería, Departamento de Enfermería, Escuela de Ciencias de la Salud*. Puerto Rico: UMET. Retrieved from http://www.suagm.edu/umet/pdf/ciencias_de_la_salud/manual_estudiante_enfermeria.pdf
- Universidad Metropolitana. (2015). *Datos Estadísticos, Universidad Metropolitana*. Puerto Rico: UMET. Retrieved from http://www.suagm.edu/umet/srtk/pdf/fact_sheet_umet.pdf
- Universidad Metropolitana. (2011). *National League for Nursing Accrediting Commission. NLNAC. for Consideration of Continuing Accreditation for Associate and Baccalaureate Nursing Programs*. San Juan: Universidad Metropolitana.
- Valle Aparicio, J. (2012). Enseñar en Casa o en la Escuela. La Doctrina Legal sobre el Homeschooling en España. *Perfiles Educativos*, 34(138), 167-182.
- Veiga de Cabo, J., & Martín-Rodero, H. (2011). Acceso Abierto: Nuevos Modelos de Edición Científica en Entornos Web 2.0. *Salud Colectiva*, 7(1), 19-27.
- Wigodski Sirebrenik, J., & Caballero Muñoz, E. (2013). *Recursos TIC y Usos de Internet en Estudiantes de Enfermería de Chile*. Retrieved from www.recursos-tic-chil
- Zapata Álvarez, LF., Ospina Moreno, J., Sepúlveda Castaño, J.M., & López Murillo, E.E. (2013). Prototipo de Evaluación con TIC: Un Paso Hacia el Cambio Curricular. *Revista Trilogía*, (8), 93-106.
- Zapico, Y. F., & Blanco, S. R., Cónsul Giribet, M, Juanola Pagés, M^a D. (1997). Aprendizaje y Satisfacción de los Estudiantes de Enfermería en las Prácticas Clínicas. *Enfermería Clínica*, 7(1), 16-24.
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1990). *Delivering Quality Service*. New York: Free Press.

