Educational technology: assessment of a Nursing Personnel Delegation website*

TECNOLOGIA EDUCACIONAL: AVALIAÇÃO DE UM WEB SITE SOBRE ESCALA DE PESSOAL DE ENFERMAGEM

TECNOLOGÍA EDUCACIONAL: EVALUACIÓN DE UN WEB SITE SOBRE ESCALA DE PERSONAL DE ENFERMERÍA

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ABSTRACT

The use of information technology is a current reality in all fields of human knowledge. Technological incorporation has taken place in healthcare services, teaching institutions, as well as in the nurse's various work processes. This study aimed at evaluating a website developed perform a Nursing Personnel Delegation Plan, a quite relevant tool in healthcare human resources management. The methodology involved quantitative research with faculty members in the field of nursing administration and students from the eight public universities in São Paulo state offering Nursing programs. Among the major results, it was pointed out that 85% of the evaluators considered the website to be excellent or satisfactory. Comments sent by e-mail were also assessed; additionally, the website's authors performed a self-evaluation. The website was considered to be useful for both the professional practice (81.7% from excellent to satisfactory) and teaching (84.6% from excellent to satisfactory).

KEY WORDS
Educational technology.
Nursing informatics.
Education, nursing.
Internet.
Software.

RESUMO

O uso da tecnologia de informática é uma realidade em todas as áreas do conhecimento humano, nos dias atuais. A incorporação tecnológica se faz nos serviços e no ensino, nos diferentes processos de trabalho do enfermeiro. Este estudo teve como objetivo avaliar um site desenvolvido sobre o tema Escala de Pessoal de Enfermagem, relevante na gestão de recursos humanos em saúde. A metodologia envolveu pesquisa quantitativa com docentes da área de administração em enfermagem, e alunos das oito Universidades Públicas do estado de São Paulo que formam enfermeiros. Entre os principais resultados, apontamos que 85% dos avaliadores consideraram o site excelente ou satisfatório. Além disso, foram analisados os comentários enviados por e-mail e as autoras fazem uma auto-avaliação. O site foi considerado de utilidade tanto para a prática profissional (81,7% entre excelente e satisfatório) como para o ensino (84,6% entre excelente e satisfatório).

DESCRITORES
Tecnologia educacional.
Informática em enfermagem.
Educação em enfermagem.
Internet.
Software.

RESUMEN

El uso de la tecnología de informática es una realidad en todas las áreas del conocimiento humano en los días actuales. La incorporación tecnológica se hace en los servicios y en la enseñanza, en los diferentes procesos de trabajo del enfermero. Este estudio tuvo como objetivo evaluar un site desarrollado sobre el tema Escala de Personal de Enfermería, relevante en gestión de recursos humanos de la salud. La metodología envolvió investigación cuantitativa con docentes del área de administración en enfermería y con alumnos de las ocho Universidades Públicas del estado de San Pablo que forman enfermeros. Entre los principales resultados, apuntamos que 85% de los evaluados consideraron el site excelente o satisfactorio. Además de eso, fueron analizados los comentarios enviados por e-mail y las autoras hacen una auto evaluación. El site fue considerado de utilidad tanto para la práctica profesional (81,7% entre excelente y satisfactorio) como para la enseñanza (84,6% entre excelente y satisfactorio).

DESCRIPTORES
Tecnología educacional.
Enfermería informática.
Educación en enfermería.
Internet.
Programas Informáticos.

INTRODUCTION

This article approaches the evaluation of a website developed from the need to educate students on the subject of a nursing personnel delegation plan, since nothing similar was found on the market. Apart from being useful in education, the website may be useful for nursing professionals as well. The results are part of this study, which was developed in the course of a doctoral program[1].

Once the website was developed, the questions that led us to the development of this study were: whether it was appropriate for the content and proposal, whether it had quality and relevance for nursing professionals and students and whether or not it was applicable to educational processes. These questions led the authors to the design of the study, whose purpose stands on the relevance of having the previous consideration of users and experts, so that when the website was available it could guarantee some level of quality to the target public and contribute to the profession.

The literature review was structured in some topics: the interest in education in nursing, the pedagogical use of educational technologies, the administration of human resources and the nursing personnel delegation plan, for the later presentation of the methodology, results and study considerations.

OBJECTIVE

Evaluating and validating the Nursing Personnel Delegation Website with experts and users.

LITERATURE REVIEW

The interest in education in nursing

Education, in the development of people and society, requires educators to critically analyze new paradigms, since, in addition to the technological incorporation we face daily, it is also necessary to consider pedagogical relations that view the student as the subject of his own learning process, trying to consider values that are necessary to citizenship construction, such as autonomy and freedom.

The educator, tasked with the improvement of education and the qualification of critical professionals, must consider the available technologies to improve the resources used in teaching, whenever it is necessary.

In nursing graduate education the use of technology may facilitate the learning-teaching process if associated with pedagogical practices and applications, according to the needs.

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their profession, made us consider computer science as a facilitator resource, and led to the development of a tool to assist this task, through the website www.escala.fmb.unesp.br[2].

The pedagogical theory considers the student as the constructor of his own knowledge and the professor as a guide in the process, based on the emancipating and liberating proposals of Paulo Freire's entire work. In addition, the graduate student needs to assume his role as a subject of the production of knowledge, and be convinced that teaching is not the same as *transferring knowledge*, but instead creates possibilities for its production or construction[3].

The academy has been characterized by its theoretical and book-based teaching methodology, which has currently come under question in face of the technological changes that are happening in society[4].

In spite of believing that technological resources do not guarantee quality education, the authors consider this technological incorporation as a necessity for educators, especially in some thematic areas in which the resource may be a facilitator.

The pedagogical use of educational technologies

The information age is forcing a discussion among professionals on the new educational paradigms, since we are *flooded* in information, with both positive effects and a thousand possibilities and side effects, such as the new disorders that have recently enjoyed attention due to the distress caused by the excess of information. Regardless, despite all advances and criticisms, education must be worked into this scenery, as well as other aspects of the human adventure.

It is not about going from on-site to distance education, or about traditional strategies for multimedia resources, but about the transition between education in a strictly institutionalized setting to a situation of generalized exchange of knowledge managed by society, which is self-administered, mobile and contextual, in which individuals, groups and organizations are considered as potential knowledge resources[5].

Education is going through a deep and silent revolution, one in which students and educators are becoming adapted due to interest or necessity. Today, it is almost inconceivable to think of a strictly traditional education for students who have access to all kinds of resources and information from the initial stages of their school lives, and who produce researches and resources of communication and information in their school activities.

The transformation taking place in education is not limited to the available technological arsenal or to an avalanche of information; it involves a change of attitude in the student-educator pedagogical relationship.

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Following the Law of Education Guidelines and Basis established in 1996, distance education began to be encouraged, and has been regulated based on laws, which is a continuous process as needs arise. Distance education is defined in the 1st Article of the Law nº 2494/98 as an educational modality that allows self-learning, with the mediation of didactic resources that are systematically organized, presented using different information support platforms, used in an isolated or combined way, and transmitted through several means of communication[6].

Based on a point that reinforces what is already known by educators, the greater the exposure to several didactically organized resources, the greater the possibility of retaining and memorizing knowledge. Since several senses are stimulated, we believe technology may favor both the professor and the student in the educational process, by combining various stimuli, being less monotonous and broadening the student's interest. These advances have been facilitated by the internet and the world network of microcomputers.

Cyberspace designates the universe of digital networks as a place of gathering and adventure, a terrain of world conflicts, and a new cultural and economic frontier[7]. The neologism *cyberculture* refers to a set of techniques, practices, attitudes, ways of thinking and values that are developed as the cyberspace grows[5].

Computer science resources open new perspectives in education by allowing the individualization of teaching and a new reflection on the nature of learning[8].

In the context of this cyberculture, we began to work with hypertext, which is a set of ties connected together. These ties may be words, pages, images, charts, sound sequences and complex documents that may themselves be hypertexts[9].

Another possibility that arises with the development of cyberspace is simulation, which currently has been taking on a growing role in the activities of research, industrial creation, administration, learning, games and entertainment. It is neither theory nor experience; simulation is a special modality of knowledge generated by the emerging cyberculture[5].

Analyzing the production in the area of computer sciences in nursing in Brazil, we found important contributions by Brazilian nurses. Some of these contributions were available at the website of the Center of Computer Sciences in Nursing of UNIFESP, which is led by the professor Heimar Marin. This author, as well as the professor Yolanda Dora Martinez Évora, published books regarding computer science in nursing in the 1990's.

Another leading nurse created a CD-Rom on the subject of Administration of Medications[10], and others later followed him. Today, we can see that the production of materials fusing computer sciences and nursing has been increasing, even though it is an area with the potential to develop even more.

Students who have the great possibility of access, allied to a new pedagogical attitude of the educator, stop being receptors of information and become responsible for the construction of their own knowledge by using a computer to search, select and inter-relate significant information in the exploration, reflection, representation and analysis of their own ideas and according to their own way of thinking.

Administration of human resources and nursing personnel delegation

The administration of human resources is one of the most important tasks in nursing administration, since it involves coordinating activities, guiding the team, supervising the care provided and administrating the nursing services.

The nurse incorporates the knowledge of several sciences into his professional education. Among these, the science of administration contributes with theories that become all too real, especially in regards to the administration of nursing personnel[11].

Nursing is one of the most important professions in the health care arena contributing to the care of the human being, not in terms of reputation, power and remuneration, but in terms of the priceless value of care provided by the greatest contingent of human resources in health care institutions. Computing is a science that has been incorporated into the care, administrative, educational and scientific working processes of nursing.

In this context, the nurse utilizes the nursing scale. These aspects establish the background of a profession that has several unique questions to be analyzed; for example, gender, since the nursing working force is predominantly female, and works in shifts, staying 24 hours by the side of the hospitalized client.

How can the nurse be prepared to administrate this complex field? It is the responsibility of the educators to face the challenge of providing the necessary context for the construction of the student's knowledge, which is going to converge in the experience, through the process of action-reflection-action.

The matter of job absenteeism shows that, hidden in these absences, there may be indicators of problems inherent to the professional context, which demands flexibility of the professional in order to guarantee the presence of the team on all shifts. It is also known that the lack of flexibility in the working shifts have a relationship to this absenteeism.

Thinking about these conditions is fundamental when talking about nursing scales. In terms of a humanist education, students must be sensitive to these questions, since it is not possible to talk about care humanization without considering the human aspects of those who provide it. The nursing scale must be elaborated without forfeiting the legal working rules and in order to guarantee quality care

and its continuation. Each task is complex and it is a challenge to teach students how to perform this activity, since it requires knowledge about the working legislation and the ability to deal with people, among others.

When a student has to create a scale he sometimes has great difficulty and tends to forget the working legislation. The association of technological resources to this need originated the development of the website, where all this information is quickly accessed.

METHOD

This is a quantitative, exploratory and descriptive study. Data collection was processed through an on-line electronic form that was available at the website from December 2002 to January 2003. The study also analyzed messages sent by the participants via e-mail. Regarding the evaluated items, the study was based on recommendations regarding the evaluation of websites[12] and on the Behavioral Code of the Health on the Net Foundation[13], on the points in which it applied.

Professors were invited to participate in the evaluation according to the way they mastered each subject. These professors belonged to the area of Administration in Nursing from Public Schools of São Paulo, under the condition of experts. Students who had graduated the nursing course in 2002 also participated under the condition of users. The invited schools were: Nursing School of USP (EEUSP); Nursing School of Ribeirão Preto of USP (EERP-USP); Federal University of São Paulo (UNIFESP); Federal University of São Carlos (UFSCAR); Medical School of Marília - FAMEMA; Medical School of São José do Rio Preto (FAMERP); State University of Campinas (UNICAMP) and State University of São Paulo (UNESP).

The project was approved by the Committee of Ethics and Research of the Medical School of Botucatu (Nº 050/99). Once the official letter and project were sent to the administration of the schools, the participants were contacted by telephone, e-mail and personally, while the researcher was visiting these schools. Personal contact was the priority, but it was not possible in some situations.

The difficulties that arose in the stage of evaluating the website were technical problems and the delay in the website release; since students were graduating at the time in most of the schools, some of them did not have an e-mail address and not all of the schools had organized information containing the students' e-mail addresses. This reality would probably be different nowadays.

There were no difficulties in the personal contact of participants in the two schools UNICAMP and EERP-USP. All students from Ribeirão Preto were contacted by e-mail. The professors of EERP USP were contacted by e-mail, whereas the person in charge of the discipline was contacted by telephone. Regarding UNICAMP, we previously had the opportunity to talk to a professor of the discipline at an event and, later, we sent an e-mail and also made contact by telephone. Students of UNICAMP were contacted by e-mail, and by telephone in the case of the student who was designated as the leader of the group and who offered to help to promote the invitation.

All e-mails indicating difficulties, doubts or expressing someone's willingness to collaborate were answered. The purpose, besides guiding the participant, was to thank everyone, even when the person had not been able to finish the evaluation.

The study subjects were instructed to visit the website and answer the evaluation.

RESULTS AND DISCUSSION

Invitations to participate in the evaluation were offered to 438 people, including students and professors, with the acceptance of 41 registered participants; from this total 27 answered the evaluation completely.

The evaluation will be presented in three stages. The *first* stage presents the quantitative evaluation; the *second* stage shows the classification of the received e-mails and the *third* stage presents a self-evaluation; in other words, a criticism from the point of view of those who developed the product and see improvement possibilities.

Stage 1 – Evaluation of the study subjects

All 41 subjects who registered, including 24 students and 17 professors, were female. Out of those 41 subjects, 27 effectively answered the evaluation, 52% were between 15 and 30 years old and 48% were between 31 and 60. The average time each person took to answer the evaluation was 30 minutes; 40% of the evaluators took less then 15 minutes.

From the 27 complete evaluations, 15 belonged to students representing 4% of the students' universe, and 12 were professors representing 32% of the professors' universe. This is a significant percentage, in regards to the professors, since they were also considered to be experts for the evaluation. As for the participation of the students, besides the difficulties already mentioned, it is worth highlighting that at the time there were several browsing difficulties, both due to the digital exclusion and to link technological problems with the telephone operator. There was no availability of faster browsing processes as there is nowadays with the advent of high-speed access, not to mention the unfavorable period of the year, which could not be extended due to the defense deadline.

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Table 1 – Interface evaluation with users of the Nursing Personnel Delegation Website, applied to professors and students of Public Nursing Schools in the state of São Paulo - São Paulo - 2003

Evaluated Item	Criterion				
	Excellent %	Satisfactory %	Reasonable %	Dissatisfactory %	Total %
Design of the Screens	46.15	42.31	11.54	0	100
Use of Colors	42.3	50	3.85	3.85	100
Browsing Commands	50	42.3	7.7	0	100
Environment	38.46	50	11.54	0	100
Sound	37.5	45.83	16.67	0	100
Images	57.7	26.92	15.38	0	100
Simulation	48	36	16	0	100
Hypertext	50	34.62	15.38	0	100
Browsing Speed	57.7	38.46	3.84	0	100
Response Speed of the Buttons	57.7	42.3	0	0	100

Note: The criterion poor also existed in the form, but since it was not chosen the table does not show it.

The quantitative evaluation of content will be presented in 5 charts (Legislation, Humanization, Simulation, Statements and References). The variables used in each one of the topics were: subject mastery, organization/presentation, current information and professional and teaching applicability.
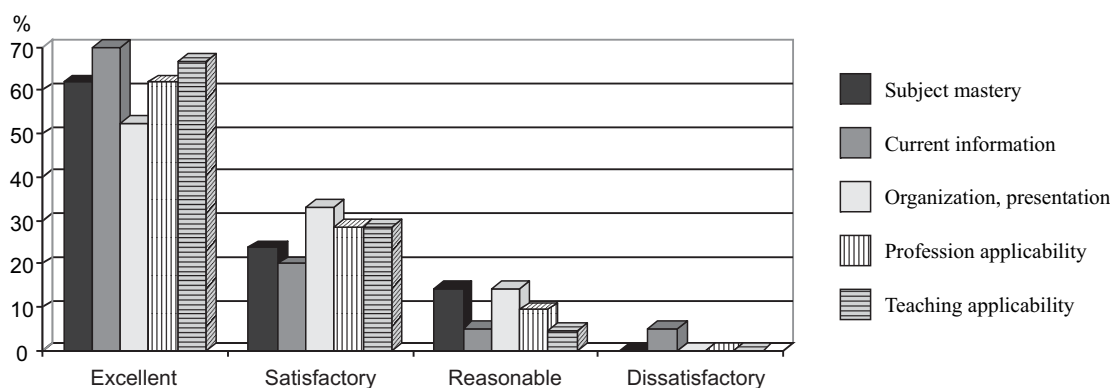

Figure 1 - Evaluation of the topic *Legislation* - São Paulo - 2003
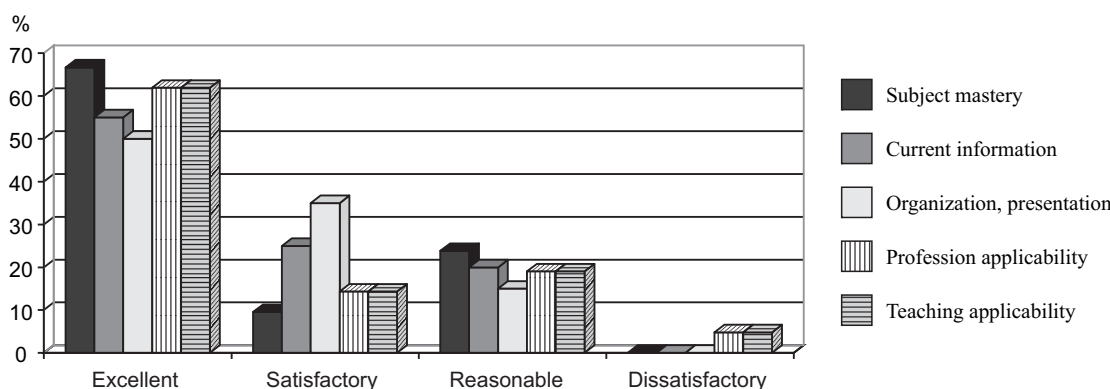

Figure 2 - Evaluation of the topic *Humanization* - São Paulo - 2003

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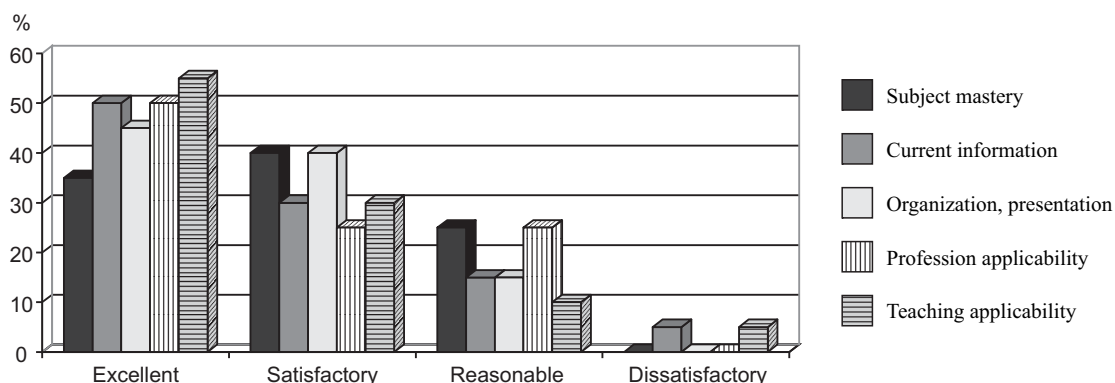*Juliani CMCM, Kurcgant P*

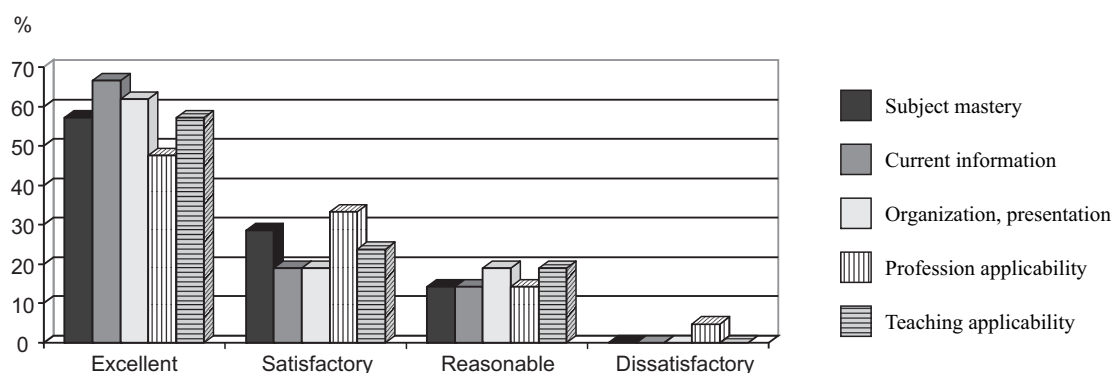**Figure 3** - Evaluation of the topic *Simulation* - São Paulo - 2003

Figure 4 - Evaluation of the topic *Statements* - São Paulo - 2003
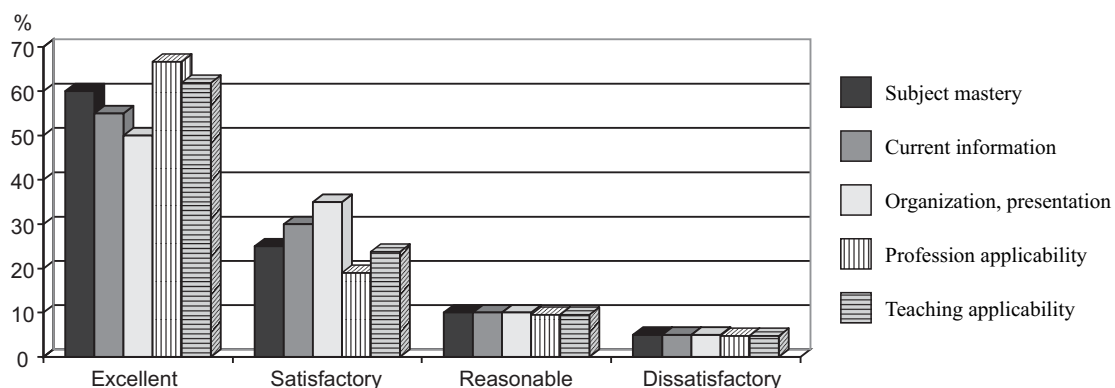

Figure 5 - Evaluation of the topic *References* - São Paulo - 2003

The website was positively evaluated, since most of the answers are concentrated in the categories excellent and satisfactory, decreasing in frequency up to the item reasonable. Only one participant considered some points as dissatisfactory, and the variable poor that was present in the form was not considered in any evaluation.

The acknowledgement of the computer as a support instrument has brought an accelerated growth and dissemination to the area of computer science in nursing. Today, the computer is considered an essential resource to assist the professional[14].

Nurses, as is also the case in other professions, must use computing resources to improve productivity and quality; to add to an d analyze relevant information for making decisions; and to efficiently perform their functions[15].

A recent study that compares the knowledge gained between two groups of nurses who used *e-learning* applications and those who received on-site training showed similar knowledge apprehension, which shows the efficacy of both methods[16].

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Stage 2 – Comments sent by e-mail

Comments sent by e-mail conveyed problems with the technology, apart from comments about the website itself. These were divided into two categories: *problems with the technology* and *comments about the website*.

Category 1 – Problems with the Technology

The following messages were selected from the received e-mails.

> I couldn't finish completing the fields because the page was going on and off. I will visit the website again at another opportunity. I'm sorry I didn't do it before, but it is the end of the year, the end of the course, you understand, right? (FAMERP student).

> I am sorry I couldn't evaluate your work, one of the reasons is because I am on vacation and I have to use computers from internet houses, and sometimes the page does not load, just expires, and the connection is difficult (UNESP student).

> I'm sorry but I couldn't finish the research due to access problems. Good luck! (EEUSP student).

> I tried 4 times (on different days and at different times) to set up a login to access the scales but I couldn't. It just says that a problem has occurred and that it was not possible to load the page (UNIFESP professor).

> I keep trying to participate in your research and I still think I am doing something wrong. An error says that I have a login but it doesn't give me the password (EE USP professor).

> Some professors registered at the scale website, but can't answer the evaluation, we believe it is because of technology problems (FAMERP professor).

Category 2 – Comments about the Website

> ...at the registration part I insert all data but I can't go on, because it says the page cannot be displayed. The website introduction is very nice, though (UNESP student).

> as far as I could see, the website is very good and interesting!!! Congratulations for the good work (UNESP student).

> I received the invitation to evaluate the website… I visited it and found it very interesting and useful, mainly for students… I graduated last December, which is why it took me some time to access it (EERP USP student).

The statements of some students indicate they value this kind of initiative, confirming other studies previously presented that reiterate this point of view of students.

Data from the evaluation of professors regarding the use of computer science in teaching show that 77.2% believe the computer assists the development of logical reasoning and creativity, 59.4% state educational software is interesting and favorable, and 81% consider the use of the computer stimulating and enjoyable [17].

Education is, and will always be, an important aspect of computer science in nursing, and the use of technology has the advantage of facilitating the access of information [18].

Hypermedia in education in nursing may contribute to the construction of a profession that does not separate sense and knowledge, a profession that is aware of the fact that creativity always arises where it is not expected: from the union of disciplines and different points of view, thus recognizing that our social-technical systems associate human aspects and technical devices [19].

Stage 3 – Self-evaluation of the researcher

Considering our involvement with the development and evaluation of the website, we also used this opportunity to make a self-evaluation, pointing out areas of improvement and problems that may have made the evaluation more difficult.

One of the needs we found, and that was also indicated by one of the evaluators, was the need to determine periods of work in the simulation working scale as well, since this is only possible for work leaves and vacation. Faced with a choice between aesthetics and the attractiveness of the site and the need to avoid overloading the website and guaranteeing fast browsing, we chose simplicity of design in colors and images. The registration and login may have complicated the evaluation for some people; however, the system with login was recommended by the computing professor who assisted in the project. The fact that the students were graduating also made the evaluation more difficult. It was observed that not everyone was in the habit of checking their e-mails regularly. There was also a problem with some numerical fields that had not been treated and complicated the login; for instance, if the evaluator inserted a period, it would cause an error. These technical failures were noticed by chance and depend on the schedule viewed.

The lack of familiarity with technology of some of the evaluators was evident when, in some cases, we could explain to the evaluator what to do by telephone, and as a result the process became easier and quicker. The fact that some difficulties were solved by talking to the evaluator demonstrates the importance of the professor's mediation in the software use. The mediator or professor is indispensable, with or without technological resources for teaching.

Based on all of the mentioned limitations, the stages of publishing on the internet and the evaluation were rewarding, since the website is a resource available today, and requires constant review. Using the information available, organized by themes, and based on the corresponding legislation, as well as accessing statements of other professionals and making exchanges with the author, the process through the internet becomes more dynamic.

FINAL CONSIDERATIONS

Based on the results, the website is considered useful for both nursing education and nursing professionals. Consider-

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ing the fact that the study had the participation of professors from the Nursing Administration area, who are experts in the area, the evaluation was positive. The following approval percentages were found in the sum of the items excellent and satisfactory: Design of the Screens 88.45%, Browsing Speed 96.15%, Legislation (Profession Applicability) 90.47%, Legislation (Teaching Applicability) 95.23%, with an average approval of 85% for all evaluated items.

The authors hope to be able to perform the necessary and continuous reviews of the website, so that it may constitute a space for Brazilian nursing exchanges. In addition, they believe the availability of the work legislation, as well as the nursing context, is a tool of interest for nursing students and professors.

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