

EDUCATIONAL SOFTWARE FOR SCHEDULING NURSING PERSONNEL: ELABORATION, DEVELOPMENT AND APPLICATION THROUGH THE INTERNET¹

Carmen Maria Casquel Monti Juliani¹

Paulina Kurcgant²

Juliani CMCM, Kurcgant P. Educational software for scheduling nursing personnel: elaboration, development and application through the internet. Rev Latino-am Enfermagem 2007 julho-agosto; 15(4):639-44.

This study aimed to describe the development stages of software about Nursing Staff Scale, created to support teaching of the subject, as well as to serve as a consultation instrument for professional nurses, since it joins labor legislation, testimonies and simulation. The adopted methodology consisted of the planning and developmental phases, with various stages and professionals, as detailed in the article. Although the need for continuous updating of the system is recognized, the availability of a resource that is easily accessed through the world wide web is considered an advance in teaching and in nurses' management practice.

DESCRIPTORS: educational technology; software; nursing; human resources

SOFTWARE EDUCATIVO SOBRE ESCALA DE PERSONAL DE ENFERMERÍA, ELABORACIÓN, DESARROLLO Y APLICACIÓN A TRAVÉS DE LA RED

El propósito de este estudio fue describir las etapas de desarrollo de un software sobre el tema Escala de Personal de Enfermería, creado para subsidiar la enseñanza del tema, bien como servir de instrumento de consulta a los profesionales enfermeros, ya que reúne, entre otros tópicos, la legislación laboral, testimonios y simulación. La metodología utilizada se constituyó de las fases de planeamiento y desarrollo, que involucró varias etapas y profesionales, conforme detallado en el artículo. Aunque se reconoce la necesidad de actualización permanente del sistema, se considera un avance, en la enseñanza y en la práctica gerencial de los enfermeros, poder contar con un recurso al cual se puede acceder fácilmente en la amplia red mundial de computadoras.

DESCRIPTORES: tecnología educacional; programas de computación; enfermería; recursos humanos

SOFTWARE EDUCACIONAL SOBRE ESCALA DE PESSOAL DE ENFERMAGEM: ELABORAÇÃO, DESENVOLVIMENTO E APLICAÇÃO VIA INTERNET

O propósito deste estudo foi descrever as etapas de desenvolvimento de um software sobre o tema Escala de Pessoal de Enfermagem, criado para subsidiar o ensino do tema, bem como servir de instrumento de consulta aos profissionais enfermeiros, uma vez que reúne, dentre outros tópicos, a legislação trabalhista, depoimentos e simulação. A metodologia utilizada constituiu-se das fases de planejamento e desenvolvimento, sendo que essa última envolveu várias etapas e profissionais, conforme detalhado no artigo. Embora se reconheça a necessidade de atualização permanente do sistema, considera-se um avanço, no ensino e na prática gerencial dos enfermeiros, poder contar com um recurso que pode ser facilmente acessado na ampla rede mundial de computadores.

DESCRIPTORES: tecnologia educacional; software; enfermagem; recursos humanos

¹ Paper extracted from Doctoral Dissertation, funded by CNPq; ² RN, PhD, Botucatu Medical School, Paulista State University "Júlio de Mesquita Filho", Brazil, e-mail cjuliani@fmb.unesp.br; ³ Full Professor, University of São Paulo School of Nursing, Brazil, e-mail: pkurcg@usp.br

INTRODUCTION

Human resource management is a primary function among nursing professionals' functions and activities in this area include nursing personnel scheduling. This activity is quite important because its development, negotiation and execution involves many issues, such as work legislation, personal life organization and relationships among team members. In addition, it falls under autonomy and power issues, since is not always possible to create a democratic composition and, oftentimes, those with less decision power need to comply with the determination of others who have such power.

Nurses, to the example of what occurs in other professions, must use computer resources to improve productivity and quality, as a way of aggregating and analyzing relevant information for decision making and for the efficient performance of all their functions⁽¹⁾.

The development of the nursing staff schedule involves many variables that confers complexity to the realization of this activity and, likewise, to its teaching in the nursing education process.

The distribution of nursing staff is a complex activity that requires time and knowledge regarding the needs of the clientele, unit dynamics, characteristics of the nursing team and the work laws⁽²⁾.

Based on this problem, we proposed the creation of a website about nursing staff scheduling to be used both in undergraduate nursing teaching and by professionals.

Computer resources open new perspectives in education because they allow us to customize teaching and also to rethink the nature of learning. However, they cannot be restricted to courses that only aim to teach student how to use the computer, but should rather be a facilitator and increase the potential of the teaching/learning process⁽³⁾.

Through an important channel like the Internet, computer technology can be a relevant tool in certain knowledge areas and we consider that joining these possibilities to the teaching of the nursing staff schedule theme was an appropriate proposal. We believe that, in combination with other strategies, this development can contribute to the educative process on the theme.

The internet has been little explored by nursing and there is a need to pay heed to present and future changes. One of these changes can be the emergence of new products and markets in which

nursing can be inserted. Like other professions in the health area, nursing started to perceive the Internet as a means through which health information could be disseminated better, whether for professional exchange, as a resource for research and/or as a tool to promote education in health⁽⁴⁾.

In Brazil, the articles published in this area are not as numerous as the productions, although they have increased in recent years. Because of the difficulties inherent to an innovation process, pioneering productions, in turn, do not always manage to advance from the prototype phase to a broader use in the profession. The production in nursing informatics is not limited to prototypes, but we highlight this fact because it may be contributing to the reduced dissemination and use of these important tools by nursing professionals.

Informatics is an important science that has been incorporated in nursing work processes, whether in care, administration, education or science⁽⁵⁾.

Without any claim on being comprehensive, below, we mention some of the important productions in the Nursing Informatics area. There is the production of a CD-ROM on medication administration⁽⁶⁾ at the Ribeirão Preto College of Nursing. Websites on coronary disease⁽⁷⁾, aspiration of traqueobronchial secretions⁽⁸⁾ among others were developed at São Paulo Federal University. At the USP College of Nursing, a CD-ROM on burns⁽⁹⁾ and a prototype for the administrative activity of nursing scheduling were developed⁽¹⁰⁾.

Based on this problem, we proposed the development of a site on nursing staff scheduling, to be used in undergraduate nursing teaching and also by nursing professionals.

Thus, this project aimed to develop educative software on the theme Nursing Staff Schedule and make it available on the Internet. The aim was to contribute both with to undergraduate students and professionals, who can seek these resources for review and/or updated information.

MATERIAL AND METHOD

A broad search was performed in the Lilacs and Medline databases, which did not reveal any software or site that addressed teaching on the theme proposed in this study. In addition, we sought the necessary foundations in informatics and pedagogy.

The system was developed between 2000 and 2003 with the support of pedagogic and computer science professionals from São Paulo State University (UNESP), although the computer professionals belonged to another Campus, since we did not find all the technical support necessary in our unit. This fact required a longer time for the development, given the need to travel to another city in order to participate in planning meetings.

Some reports were made available on the website. Therefore, interviews were held between November 2000 and January 2002. These interviews were tape-recorded after the signing of the free and informed consent term approval by the local Institutional Review Board. In total, four nurses and five nursing aids were interviewed, some of whom elaborated and others complied with schedules in their professional activities.

ELABORATION PHASES

The elaboration phases described below involve, in the aspects it applies to, (authority, complementarity, attribution, transparency in propriety), compliance with the Health on the Net Foundation Code⁽¹¹⁾, since the site is not sponsored by private firms and has no commercial, but only educative purposes.

Bibliographic Review

A search in national and international bases and dissertation bases was performed and we also sought national authors who study the nursing informatics area, in addition to documents originated from correlated organizations, such as the Brazilian Society of Informatics in Health for example, and also that part of the Brazilian labor legislation which affects the organization of a staff schedule. We used the descriptors: nursing, staff schedule, human resources, site, educational technology, software.

Software Development

Educational software is a program developed to meet previously established educational objectives and, for it to be effective and meet the pedagogical needs, its development needs to count with education and informatics specialists⁽¹²⁾. Thus, we sought pedagogical advice from a professor from the Department of Education of the Biosciences Institute at UNESP.

We started the structuring of the conceptual network by trying to determine the associative levels and linkage with pedagogical revisions because, to the extent that we were structuring the network, we performed revisions according to suggestions from our advisor. Also, to the extent that system configurations were planned, we met with those responsible for the informatics area (another Campus), who were gradually developing parts of the product. Successive revisions were performed until we achieved the final format.

The pedagogical option for the site was to work in the perspective that considers the student as the constructor of his(er) own knowledge, in which the teacher must be the advisor/facilitator of the educative process, based on Paulo Freire's emancipating and liberating proposals⁽⁵⁾. According to this author, the student must be a subject of the knowledge production and the educative process must create the possibilities for its production or construction⁽¹³⁾.

SITE RESOURCES

On the initial page, the user will find the following menu: presentation, human resource management, legislation, humanization, simulation, reports, reader's room, research, bibliography and site map.

Each of the topics leads to secondary levels and, depending on the case, there are other deeper, reference or explanation levels. Through the site map, users can also navigate through the active links.

On this site, students and professionals find the labor legislation organized according to the more usual situations of leave, for example, maternity leave, overtime, to mention but a few possibilities. By accessing each item, they can find, linked to the specific situation, the legal foundation correspondent to the Consolidation of Work Laws (CLT) or, in the case of public employees, the São Paulo Statute for Public Employees.

The intention was for the student to become responsible for the construction of his(er) knowledge instead of only receiving information, using the resource to search, select and interrelate significant information by means of exploration, reflection, representation and purification of his(er) own ideas, according to his(er) thinking style⁽⁵⁾.

For the student to be able to perform this exploration, a resource that has been effective, habitual and whose incorporation as an educational tool is being consolidated is the search for sites on the Internet.

The Internet is a valuable resource for those who do not have the information they need when confronted with a problem in practice. The computer allows people to easily find all kinds of information⁽¹⁴⁾.

In addition to the content per se, certain interview extracts were selected after content analysis and made available on the site. These extracts were organized in two topics: reports from those who elaborate and from those who comply with schedules.

In order to prevent identification of voices, the extracts were transcribed, a radio presenter recorded them in a studio and, later, they were inserted in the site as mp3 files. Besides the reports, a simulation item was also elaborated. This offers the possibility for the visitor, after registering, to perform and send simulation exercises of a schedule. This simulation is interesting for teaching, because the teacher can visualize it from the administrator site and send comments and notes directly to the student's e-mail.

Nowadays, simulation plays an increasing role in scientific research, industrial development, management, learning and also for games and leisure. For the author, simulation is neither theory nor experience, but a form of industrialization of the thought experience, a special mode of knowledge, characteristic of the incipient cyberculture⁽¹⁵⁾.

The simulation was one of the most complex elements to develop, because it involved programming, calendar and some artificial intelligence tests, for example: not permitting the student to provide leave or excused absence to an employee who is hired under a work contract determined by the CLT.

HOSTING THE SITE

An introduction for the site was elaborated and the system was recorded on CD-ROM. Initially, the site was hosted by the USP College of Nursing because it was related to a graduate product. This happened because, at that moment, we did not find all the conditions needed to host the site at UNESP, which happened later on, in 2004. Thus, nowadays, the site can be accessed on www.escala.fmb.unesp.br.

RESULTS

As a result, we have a product published on the website, whose initial screen is presented below for the sake of illustration.



Figure 1 - Presentation screen of the Nursing Staff Schedule site.

FINAL CONSIDERATIONS

We have increasingly observed the penetration of the internet in the academic environment as a source of research, dissemination and learning. The internet is currently considered an important means of communication and its insertion in the education area is of great importance, because it permits fast and cheap access to a wide range of topics, including the dissemination of scientific research⁽¹⁶⁾.

A study⁽¹⁷⁾ analyzed students and detected extremely positive attitudes towards the use of the computer resource in nursing teaching, as well as interest and pleasure due to the use of this resource.

We consider the development of this and other similar tools very useful when available on the World Wide Web.

Education is and will always be an important aspect of informatics in nursing and the use of technology aims to facilitate information access⁽¹⁸⁾.

One of the great advantages, which will be more precisely verified in future research, in similar staff schedule sites, seems to be related to the availability of organized legislation in a way that is familiar to those developing the schedule, that is, by topics nurses are used to work with in their routine.

Another positive point is related to the possibility for the student to listen to and reflect on the reports available on the site, both from people who elaborate the schedules and those who have to comply with them. These professionals' experience offers elements that enrich the students' learning, because they go beyond the mere legal or formal aspects involving the theme.

The system has been used in undergraduate and graduate teaching and has undergone alterations, because continuous improvement is necessary given the constant suggestions users give to enrich it. One of the limiting factors in terms of agility in this process is the insufficient number of human resources in the informatics area. They increasingly do not manage to comply with demands, which are growing for the development of virtual productions, organization of sites, among others.

We believe that the critical use of the available technology will allow teachers, and consequently the academic structure they are linked to, in this case to the university, a better preparation for the future, also allowing room for other possibilities like distance learning, which is strongly stimulated nowadays and politically supported by public institutions. These reflexes are already becoming reality in other experiences which we have had the chance to participate in through distance learning.

We hope to be able to continue improving the site, contributing to teaching and to the Nursing Informatics area.

ACKNOWLEDGEMENTS

- Dr. Miriam Celi Pimentel Porto Foresti - pedagogical advisor;
- Dr. Wilson M. Yonesawa - informatics advisor, including his students Mirian Tiemi Kimura and Rafael Taro Osako;
- Cláudia Breithaupt - report narration
- Informatics Technical Office - EEUSP - hosting the site.
- Informatics Technical Service / NEAD-TIS Botucatu Faculty of Medicine - hosting and updating the site.

REFERENCES

1. Sperandio D, Evora, YDM. Nursing care planning: proposal for a software prototype. *Rev Latino-am Enfermagem* 2005 novembro-dezembro; 13(6):937-43.
2. Massarolo MCDB. Escalas de pessoal de enfermagem. In: Kurcgant P, editor. *Administração em enfermagem*. São Paulo: EPU; 1991. p. 107-15.
3. Peres HHC, Duarte YAO, Maeda ST, Colvero LA. Estudo exploratório sobre a utilização dos recursos de informática por alunos do Curso de Graduação em Enfermagem. *Rev Esc Enferm USP* 2001; 35 (1): 88-94.
4. Marques IR, Marin HF. Enfermagem na WEB: o processo de criação e validação de um WEB site sobre doença arterial coronariana. *Rev Latino-am Enfermagem* 2002 maio-junho; 10(3):298-307.

5. Juliani CMCM. *Tecnologia educacional: produção e avaliação do site escala de pessoal de enfermagem*. [tese]. São Paulo (SP): Escola de Enfermagem/USP; 2003.
6. Cassiani SHB. *Um salto para o futuro no ensino da administração de medicamentos: desenvolvimento de um programa instrucional auxiliado pelo computador*. [tese]. São Paulo (SP): Escola de Enfermagem de Ribeirão Preto/USP; 1998.
7. Marques IR. *O processo de criação e validação de um web site sobre doença arterial coronariana*. [dissertação]. São Paulo (SP): Universidade Federal de São Paulo; 2000.
8. Diogo RC. *Desenvolvimento do Web site educacional sobre Intervenção de enfermagem: aspiração de secreções traqueobrônquicas*. [dissertação]. São Paulo (SP): Universidade Federal de São Paulo; 2001.
9. Paiva SS. *Queimaduras: atendimento hospitalar ao paciente adulto na fase inicial da injúria (software auto-instrucional)*. [tese]. São Paulo (SP): Escola de Enfermagem/USP; 2001.

10. Aurich EA. Informatização de tarefa administrativo-burocrática em Enfermagem: proposta de construção de protótipo de sistema de elaboração de escala mensal de pessoal. [dissertação]. São Paulo: Escola de Enfermagem/ USP; 2002.
11. Health On the Net Foundation. Código de conduta para sites web de medicina e saúde. Tradução para o português: César de Azevedo Gil -Banco Nacional de Desenvolvimento Econômico e Social - BNDES [online] 2000 Feb. [acessado em 2006 Out 05] [1 tela] Disponível em: <http://www.hon.ch/HONcode/Portuguese/>
12. Lucena MWFP. O uso das tecnologias da informática para o desenvolvimento da educação. Universidade Federal do Rio de Janeiro; 1994. (Publicações Técnicas, ES- 301).
13. Freire P. Pedagogia da autonomia. São Paulo: Paz e Terra; 1996.
14. Évora YDM. As possibilidades de uso da internet na pesquisa em enfermagem. Revista Eletrônica de Enfermagem [periódico online] 2004 Set-Dez [acessado em 2006 Mar 28]; 06(03): [5 telas]. Disponível em http://www.fen.ufg.br/Revista/revista6_3/pdf/11_Revisao1.pdf
15. Lévy P. Cibercultura. 2ª ed. Rio de Janeiro: Editora 34; 2000.
16. Silva FB, Cassiani SHB, Zem-Mascarenhas SH A Internet e a enfermagem: construção de um site sobre administração de medicamentos. Rev Latino-am Enfermagem 2001 Janeiro; 9(1):116-22.
17. Telles Filho PCP, Cassiani SHB. O computador no ensino de enfermagem - análise das atitudes de discentes de instituições de nível superior. Rev Latino-am Enfermagem 1999 janeiro; 7(1):93-8.
18. Marin H. Nursing informatics: current issues around the world. Int J Med Informatics 2005 december; 74(11-12):857-60.