

# Building a virtual environment for distance learning: an in-service educational strategy

A CONSTRUÇÃO DE UM AMBIENTE VIRTUAL DE APRENDIZAGEM PARA EDUCAÇÃO A DISTÂNCIA: UMA ESTRATÉGIA EDUCATIVA EM SERVIÇO

CONSTRUCCIÓN DE UN AMBIENTE VIRTUAL DE APRENDIZAJE PARA EDUCACIÓN A DISTANCIA: UNA ESTRATEGIA EDUCATIVA EN SERVICIO

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## ABSTRACT

This study aims to describe the construction of a virtual learning environment (VLE) in a social network for implementing distance learning (DL), developed in a public cardiology hospital by 23 nurses from the Education Group. The construction and implementation were carried out at the workplace, following the structuring phases of the education, development, and evaluation of the VLE for the DL Group from the perspectives of tutors and students. The learning and development of technological knowledge were found to occur alongside an increase in the knowledge of how to construct and utilize a VLE. The difficulties encountered were related to a lack of expertise, time, and infrastructure. Limitations relating to the required tools and internet access were also identified. To make the project possible, the nurses developed up-to-date skills, technological expertise, and creativity, as well as the ability to search for alternative resources to overcome structural difficulties, build team skills, and implement in-service innovative educational processes.

## DESCRIPTORS

Education, distance  
Education, nursing  
Educational technology

## RESUMO

Este estudo objetivou descrever sobre construção de um Ambiente Virtual de Aprendizagem (AVA) em rede social para a implementação da Educação a Distância (EAD), desenvolvido em instituição hospitalar pública cardiológica por 23 enfermeiros do Grupo de Educação. A construção e a implementação foram realizadas em serviço, seguindo as etapas de estruturação do Grupo de Educação, Construção e Avaliação do AVA para EAD no olhar de tutores e alunos. Verificou-se que houve aprendizado e evolução do conhecimento tecnológico e valorização da construção e utilização do AVA. As dificuldades relacionaram-se à falta de conhecimento específico, tempo e infraestrutura. Também foram identificadas limitações relacionadas às ferramentas e ao acesso à internet. Para viabilizar o projeto, o enfermeiro desenvolveu competências de conhecimento específico e tecnológico atualizado, criatividade, busca de recursos alternativos para superação de dificuldades estruturais, mobilização coletiva e implementação de processos educativos inovadores em serviço.

## DESCRIPTORIOS

Educação a distância  
Educação em enfermagem  
Tecnologia educacional

## RESUMEN

Este estudio objetivó describir la construcción de un Ambiente Virtual de Aprendizaje (AVA) en red social para la implementación de la Educación a Distancia (EAD), desarrollado en institución hospitalaria cardiológica pública con 23 enfermeros del Grupo de Educación. La construcción e implementación fueron realizadas en servicio, siguiendo las etapas de estructuración del Grupo de Educación, Construcción y Evaluación del AVA para EAD en la visión de tutores y alumnos. Se verificó que existió aprendizaje y evolución del conocimiento tecnológico, y valorización de la construcción y utilización del AVA. Las dificultades se relacionaron con la falta de conocimiento específico, tiempo e infraestructura. También se identificaron limitaciones relativas a las herramientas y al acceso a Internet. Para hacer posible el proyecto, los enfermeros desarrollaron competencias de conocimiento específico y tecnológico actualizado, creatividad, búsqueda de recursos alternativos para la superación de dificultades estructurales, movilización colectiva e implementación de procesos educativos innovadores en servicio.

## DESCRIPTORIOS

Educación a distancia  
Educación en enfermería  
Tecnología educacional

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## INTRODUCTION

Distance learning (DL) has steadily been gaining ground because of the intense process of globalization and the creation of innovative technologies in various fields of knowledge. The advancement of information and communication technologies (ICT) propels this growth<sup>(1)</sup>. New educational methods play an important and innovative role in the educational setting, a context in which DL holds a position of high regard and great importance in politics and the economy in general, making it a valuable survival strategy for professionals<sup>(1-2)</sup>.

DL is defined as a systematic educational process that allows individual or group study through the use of technologies and of multiple communication channels between participants. It is a form of organized self-study, supervised by a group of teachers who guide and monitor students' development from a distance<sup>(3-4)</sup>. It is an important alternative to continuing education, as it provides the possibility of disseminating information, eliminating geographical barriers, and optimizing time during the development of the proposed activities<sup>(5-6)</sup>.

DL can maximize the potential of the individuals involved; establish multidirectional communication, relationships, and interactions; and promote the exchange of experiences and sharing of knowledge. It can be used as a strategy for continuing education, which requires the development of research studies in this area in order to be achieved.

Continuing education is a major concern for the Ministry of Health in Spain, as it is seen as a measure capable of transforming educational practices in various fields, such as training, healthcare, management, policy formation, mainstream participation, and social control in the healthcare industry. It enables healthcare professionals to develop a new style of training and critical self-assessment<sup>(1)</sup>.

The current demand for *know-how* requires an individual to be able to constantly learn independently. Thus, continuing education is presented as a capacity to be developed in the pursuit of continuous self-improvement. In the context of on-site continuing education, the areas under study were chosen on the basis of the problems experienced in the everyday work environment, in a way that the need for knowledge based on practice leads to changes in training and professional development<sup>(7-8)</sup>.

DL developed through virtual environments allows professionals to experience the simultaneity of learning and performance, as there is no need to move away from the workplace. It creates opportunities to interact and share experiences with other professionals, adding knowledge and value to daily practice<sup>(9)</sup>.

E-learning has emerged as a solution to the social demands of education. It is believed that DL is a relevant learning process for nurses, especially when used as a strategy in the framework of continuing education<sup>(10)</sup>.

This study aimed to describe the experience of DL as developed by nurses in a hospital environment. The objective was to describe the construction of a virtual learning environment (VLE) in a social network (NING) for nurses in the Education Group at a public hospital specializing in cardiology to implement DL.

## METHOD

This study reports on an experience of DL in a public hospital and institution of excellence specializing in cardiology. A total of 23 nurses from the institution took part participated in the study; all were members of the Education Group that produced the content during the construction, implementation, and evaluation phases of the VLE with the aim of implementing DL in a social network. The study was approved by the Ethics and Research Committee of the institution, under protocol number 3973.

For the construction of the VLE and the implementation and evaluation of DL, the theoretical approach adopted was based on the development of professional abilities. These abilities were defined as responsible and acknowledged know-how, which involved mobilizing, integrating, and transferring the knowledge, resources, and skills that add economic value to the institution and social value to the individual. The notion of transfer or contribution must be added to this concept: people, as agents of transformation, perform this *transfer* to the

institution in a way that improves processes or introduces technologies, not only to achieve institutional goals<sup>(11-12)</sup>.

The phases involved in the construction of the VLE and the development of DL were as follows: structuring the Education Group, drafting the DL implementation proposal, building the VLE, developing DL, and evaluating the educational process.

## RESULTS

### ***First Phase: Structuring the Education Group***

The Education Group was established on a permanent basis in 2005 within the Continuing Education Service. It consists of 23 assistant nurses from the institution, and its purpose is to further the technical-scientific and ethical-political knowledge of nursing staff for the continuous improvement of healthcare and nursing services.

The implementation of DL was intended to find alternative educational resources geared towards the digital

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participation of nurses, as not all of them mastered the use of technology for educational purposes. Furthermore, DL aimed to facilitate the development of the asynchronous educational process at the workplace while taking into account the specificity of nurses, who have multiple employment relationships and thus have difficulty missing work in order to attend training sessions or combining studies with their work.

### **Second Phase: Building the VLE - NING**

Initially, a search for free social networks was carried out. The participants looked for a solution that did not require an additional investment beyond the pre-existing structure and that would enable the construction of the VLE and the functioning of DL. These criteria were decisive in selecting NING.

After these preparations, DL began, which took place over a period of eight months in accordance with the planned annual schedule. Two nurses alternatively acted as tutors, while the others participated as students. Each tutoring nurse was given one to two weeks to develop the course content, and this timing was indicated in the schedule provided by NING. The courses were taught in a module format, with deadlines for completing reading assignments, class participation, online meetings, and evaluations.

The tools used in the tutorials were the NING and Etherpad, an online tool enabling the development of collective work. Each participant chose a particular color and login name, and meetings along with the text creation were held in real time.

### **Third Phase: Evaluation of the DL Process in the VLE**

The evaluation was carried out with the tutors and other participants using an instrument that served to verify what was difficult or easy within the process. The evaluation was also conducted using a survey based on these criteria during the meetings held at this period.

The tutors and students mentioned that the existence of the Education Group, the support of the nursing leadership, the presence of a lead project mediator, and the engagement in a common professional goal facilitated an increase in technological and specific cardiological knowledge. It also led to an increase in the valuation of the construct and the use of the VLE for DL, a strategy that the participants considered innovative.

The participants also pointed to numerous difficulties: a lack of infrastructure, problems in using the tools, limited interaction and communication, difficulty accessing the internet, a lack of technological knowledge, a lack of time, and simultaneous teaching and healthcare responsibilities. Furthermore, the need to reconcile professional and personal activities posed a problem, as the use of technology meant that the tutoring extended normal working hours and priority was given to the students' education demands.

## **DISCUSSION**

The institution's Education Group proposed to build a VLE and implement DL. The selection of topics, lesson plans, and content was determined by the training needs of the sector.

As the VLE began to be built, it was discovered that the nurses were not aware of the social network or the VLE. Thus, a list was made in regard to the areas in need of improvement, and studies involving the use of technology in the education were identified. Participants also engaged in readings, discussions, and lectures on the use of technology in health and nursing, DL, and tutoring among other topics.

Subsequently, the pedagogical component was developed with a focus on cardiology (theme, capabilities to be developed, curriculum, strategies, audiovisual resources, assessment types, as well as the class teaching itself). Using this framework, the relevant items were developed at the workplace in order to implement the VLE. The topics covered were as follows: acute coronary syndromes, hypertension, acid-base imbalance, mechanical ventilation, heart valve diseases, cardiac arrest, intra-aortic balloon, arteriovenous fistula care, occupational health, nursing indicators, patient nutrition, stress and coping strategies, education, and nursing practices.

To become familiar with the environment and the available tools, the nurses accessed the VLE, where they created a personalized online webpage, which included photos of the members, posts on the activities undertaken in the group, and finally, the lesson plan and materials that were designed. The result thus formed a social network on NING.

When using the virtual environment, nurses sought out professional knowledge using tools found on NING, such as blogs and chatting. In doing so, this virtual space became a means of learning by way of answering questions, sharing information, and obtaining general or specific guidance.

Using the built environment, the phase of formative and prescriptive assessment began with a focus on prognosis, in which the nurses made improvements to the virtual environment as well as to the prepared lesson plans. In the online meetings, nurses analyzed the aspects of the lesson plan and reflected on the relevance of the themes, content selection, strategy proposals, teaching material, evaluation types, and the availability of the used or proposed bibliographic references.

*In the implementation phase of DL*, the tutors and students were able to experience many aspects of what they had read and discussed. Among others, these aspects related to tutoring, time management, the need for compliance with DL, real-time participation in online discussions, coherence in the programming of activities and their scheduling, the need for discipline for both the tutor and student, and a greater commitment to interactivity and communication.

The literature is still uncertain about the appropriate training and preparation for DL tutors. However, it there is consensus that the tutors' role should go beyond a technical knowledge of the tools and not be limited to information pertaining to their area of expertise. Skills should include technological competency, staff management, an in-depth knowledge of the content and learning strategies, as well as competence in communication<sup>(13-16)</sup>.

To assume the role of tutor, nurses needed to search the literature for information on *being a tutor* and on a tutor's duties with respect to students in the educational process. The experience demanded great dedication from the tutoring nurses with regards to the DL so that they could answer questions, suggest activities and readings, define the evaluation methods, and monitor the progress of the tasks, namely by instigating and guiding students throughout the process.

Further action was required in terms of content selection in order to coordinate strategies that stimulated the students to create, interact, communicate, and develop knowledge-based problem-solving skills, which led to DL being contextualized to their daily practice. The tutor, as the facilitator of the educational process, encouraged students to become qualified in healthcare services, considering the constant changes at the workplace. It was thus verified that DL

...has great potential as a tool for teaching and learning in various environments, including hospitals, by training healthcare staff and promoting greater accessibility to information in a shorter time, in the handling and use of resources, optimizing time, an essential factor in daily nursing practice<sup>(3)</sup>.

Regarding the *evaluation*, difficulties were worked on throughout the process so that the purpose of the Education Group was not impaired during this period. In this sense, our findings were consistent with what is described in the literature: namely, that the poor preparation of tutors, low availability of technical resources in the training environment, absence of government policies on training, lack of criteria, structure, and assessment of DL projects are critical factors affecting the performance of a competent tutor who intends to render the platform a creative space and is committed to the training of students<sup>(14,17)</sup>.

With regard to the participants, the difficulties reported coincide with those previously reported: autonomy, learning and mastering of the relevant tools, motivation, and conformity with the other training activities<sup>(17)</sup>. The abilities developed in order to succeed in learning included planning, developing, and evaluating the technology-mediated

educational process; acquiring knowledge and technological skills specific to cardiology; developing strategies for the digital inclusion of nurses; carrying out the diagnostic evaluation of their training needs, building the VLE; developing autonomy; and being a DL tutor as a teacher.

On the other hand, the students participating in the course were reported to have developed abilities similar to those found in the literature (i.e., the use of technology and cardiological techniques), combining their role as educators and healthcare nurses during work and reconciling their function as a nurse with that of being working women in their different social roles<sup>(18)</sup>. Success or failure depends on the attitude of the students towards DL, and involves aspects related to how DL is conducted by the institution as well as how the methodology is used<sup>(19)</sup>.

## CONCLUSION

This study described the experience of building a VLE in a social network geared towards DL and the technological inclusion used in a hospital setting. At the end of the process, it can be ascertained that our proposal was feasible, even in the hospital setting. To be achievable, institutional, political, and educational investment was necessary in addition to a proposal for the continuing education of the employee.

It can be concluded that nurses developed the necessary know-how and technological and educational abilities, as well as knowledge specific to cardiology, together with the desire to keep up-to-date and apply what was learned in order to accomplish their daily work. Additionally, they developed the ability to stay committed to their work and self-development, which may have been instrumental in the success of this in-service DL project, as it related to developing the necessary know-how.

To achieve this outcome, creativity was needed when looking for alternative resources to overcome any structural difficulties. Participants were also required to mobilize collectively in order to implement the innovative educational processes, to be willing, engaged, and committed, and finally, to invest in pursuing the established goals.

In continuation of this project, the Education Group put forth a proposal to implement a DL platform specifically made for this purpose, as this experience has promoted new conditions for developing professional qualifications, mainly aimed at mid-level professionals who have limited access and few opportunities to become part of the educational process.

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