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ESTRATÉGIAS DE ENSINO-APRENDIZAGEM COM APOIO DE TECNOLOGIAS PARA A FORMAÇÃO INTERDISCIPLINAR E INTEGRAL EM SAÚDE

TEACHING-LEARNING STRATEGIES WITH SUPPORT OF TECHNOLOGIES FOR INTERDISCIPLINARY AND INTEGRAL HEALTH TRAINING

LAS ESTRATEGIAS DE ENSEÑANZA-APRENDIZAJE CON APOYO DE TECNOLOGIAS PARA LA FORMACIÓN INTERDISCIPLINAR E INTEGRAL EN SALUD

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RESUMO

Objetivo: Descrever e avaliar o desenvolvimento de um ambiente virtual de aprendizagem para a formação interdisciplinar e integral em saúde. **Métodos:** Pesquisa descritiva, do tipo qualitativa, de avaliação de um curso, com encontros presenciais e à distância pela plataforma *Moodle*, numa amostra de 20 estudantes de cinco cursos da área da saúde. Para análise, foram consideradas as fontes de dados de avaliação cognitiva do aluno, aplicação de questionário de avaliação e o grupo focal. **Resultados:** As ferramentas *wiki* e fórum auxiliam na formação interdisciplinar em saúde por permitirem a construção colaborativa do conhecimento entre diferentes categorias profissionais da área da saúde. **Conclusão:** As estratégias de ensino e de aprendizagem utilizadas neste estudo, por possibilitarem a construção do conhecimento colaborativo, demonstraram ser importantes ferramentas que podem auxiliar no processo de formação interdisciplinar e integral em saúde.
Descritores: Tecnologia educacional; Assistência integral à saúde; Pesquisa interdisciplinar.

ABSTRACT

Objective: To describe and to evaluate the development of a virtual learning environment for interdisciplinary and integral training in health. **Methods:** A qualitative, descriptive study of a course evaluation, with face-to-face and online meetings using the *Moodle* platform, with a sample of 20 students from five health courses. For the analysis, this study considered the data sources of the student cognitive evaluation, application of evaluation questionnaire and the focus group. **Results:** The *wiki* and forum tools help in the interdisciplinary training in health by enabling the collaborative construction of knowledge among different professional categories in the health area. **Conclusion:** The teaching and learning strategies used in this study, because they allow the collaborative knowledge construction, have proved to be important tools that can help in the process of interdisciplinary and integral training in health.
Descriptors: Educational technology; Integral health care; Interdisciplinary research.

RESUMEN

Objetivo: Describir y evaluar el desarrollo de un entorno virtual de aprendizaje para la formación interdisciplinaria y global en la salud. **Métodos:** investigación descriptiva, cualitativa, de evaluación de un curso, con encuentros presenciales y a la distancia por la plataforma *Moodle*, con una muestra de 20 alumnos en cinco cursos en el área de la salud. **Resultados:** Las herramientas *wiki* y el foro ayudan en la formación interdisciplinaria en salud al permitieren la construcción colaborativa del conocimiento entre las diferentes categorías profesionales en el campo de la salud. **Conclusión:** Las estrategias de enseñanza y de aprendizaje utilizadas en este estudio, por posibilitar la construcción del conocimiento colaborativo, demostraron ser importantes herramientas que pueden ayudar en el proceso de formación interdisciplinaria y global en la salud.
Descriptores: Tecnología educacional; Atención integral de salud; Investigación interdisciplinaria.

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INTRODUCTION

Currently, information technology and information systems are increasingly available to support practice, education, research and care[1]. Information and Communication Technologies (ICT) are made up of technical means capable of manipulating information and promoting communication[2]. ICT has a reflex in the area of education and has aided in the learning process by providing tools that stimulate effective student participation[3].

This technology brings proposals for an education based on freedom, on interpersonal relationships, on the horizontality of relationships, on the negotiation of power and knowledge among participants, on community accreditation; (virtual) communities of relationship and practice, it involves and it is involved in the school and returns to communities for cross-cultural and transnational education[4].

The development of different skills to teach and to learn converges to a critical and transformative pedagogical action and the use of tools and resources of the educational technologies can mean learning to learn, modifying the educational paradigms in force until then, and pointing out the need for modifications in the roles of the subjects involved in this process[5].

Thus, it is clear that the use of ICT, through a dynamic language, can provide connectivity among students and broaden the horizons of learning, as well as to stimulate collective interactivity of knowledge, inducing new teaching and learning practices. Moreover, several studies have demonstrated that the use of ICT has favored teaching, and suggest the potentialization of its use and the continuity of new studies on the subject [6-11]. Although there is a discussion about the lack of advances in the distance education modality, it has focused on the technological innovations to the detriment of possible methodological proposals; it should take into account not only technology, but also social demands[4].

In parallel, there is a need to conduct new practices in vocational training. Brazilian legislation imposes attention to integral health as citizens' rights, which points to the need for comprehensive and interdisciplinary training in the health area, based on the needs of SUS users. Thus, it becomes necessary to rethink pedagogical practices, through the perspective of integral care, capable of breaking with the traditional model. The problem in question lies in the question: in what form would it be possible to make the necessary changes in vocational training on the axis of integrality?

In this perspective, we think of ways of articulating interdisciplinary knowledge, in the perspective of integrality, which are capable of motivating students to participate in the construction of their own knowledge. Are ICTs appropriate for the necessary empowerment?

In view of this questioning, the study was conducted through the formulation of the problem: Does the use of the virtual learning environment as a teaching strategy positively favor the training of undergraduate and resident professionals for integrality and interdisciplinarity in health? Thus, this study aimed to describe and to evaluate the development of a virtual learning environment for the interdisciplinary and integral formation in health.

METHODS

It is an applied, descriptive, qualitative research that concentrates its focus on the discovery of an immediate problem and aims to generate knowledge for practical application directed to specific problems [12]. The study was carried out in four stages: elaboration of the virtual learning environment; preparation of teaching materials; course development; closing meeting and evaluation of the course. The sources of data analyzed were: the student's cognitive evaluation, through the activities carried out, the application of an evaluation questionnaire and the focus group. It was carried out with face-to-face meetings at the Laboratory of Epidemiology and Health Management of the Nursing School of the Federal University of Alfenas (UNIFAL - MG) and also at distance by the Moodle platform.

The target population consisted of graduate scholars from Pet-Health program and postgraduate students who have resided in Family Health, both of which are courses / professionals in Nursing, Pharmacy, Physiotherapy, Nutrition and Dentistry of UNIFAL-MG. The sample consisted of 20 students, selected by random simple probabilistic sampling[13], with 14 undergraduates and six residents. The data collection was done during

the course, in the period of March, April and May of 2013.

The inclusion criteria for the student participants were: to be graduated from one of the five courses and to be regularly enrolled in the first semester of 2013 (regardless of gender); to be 18 years-old or more; to develop their academic activities in the city where the study was conducted, and to be a Pet-Health scholar. For the participating professionals, the inclusion condition was to be a resident in Family Health of UNIFAL - MG, in activity in the Program.

The exclusion criteria were for the students: to be performing a curricular or extracurricular internship in another municipality; license for health care and those who, although they are still on the lists of academic records, have requested transfer to another higher education institution or termination of the undergraduate course. For the participating professionals, the exclusion condition was being on vacation or leaving for health treatment. The four stages of the study are described below:

Step 1: Elaboration of the Virtual Learning Environment

The Virtual Learning Environment (AVA) was developed by the researchers, with the help of a computer technician, in the Moodle Platform (Modular Object-Oriented Dynamic Learning Environment) for the realization of a distance course offered by Pro-Rectory of Extension of UNIFAL - MG. The Moodle platform was chosen because it is a free software, present at UNIFAL-MG, and because it is a tool that allows the construction of knowledge in a collaborative way. The course was entitled "Comprehensive care for people with systemic arterial hypertension, using the virtual learning environment" and it was supported by a distance mentoring. The theme "Systemic Arterial Hypertension" was chosen due to its relevance as one of the most prevalent health problems worldwide.

For the preparation of the course, the researchers defined the planning of the proposed activities, the deadlines determined for each one of them, the motivational strategies, as well as the design of the icons/design for access and navigation in the course. An introductory motivational video of welcome and guidance regarding the course was recorded. The course interface was carefully designed to favor a learning route and structure the path to be taken by the student during the course. Figure 1 shows the initial screen of the Course.

Figure 1 - Initial screen of the course "Integral Care for the Person with Systemic Arterial Hypertension, using the Virtual Learning Environment".
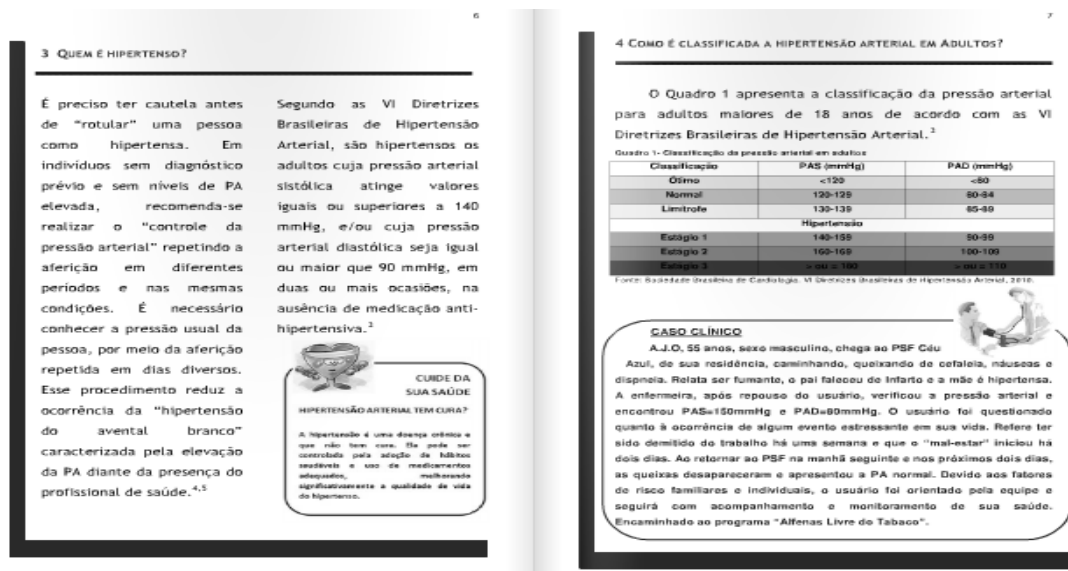

Source: Research data.

Original Article

Step 2: Elaboration of the Pedagogical Support Material

A bibliographic survey was carried out to identify the theoretical reference that best suits the course. From the survey, the pedagogical support material called "Integral Care for the Individual with Systemic Arterial Hypertension, using the Virtual Learning Environment" was prepared. This material aimed to clarify as main guidelines and protocols without treatment and follow up of the person with arterial hypertension. When it was finalized, the material was analyzed and validated by judges (PhD professors) with experience in the subject of the course (Systemic Arterial Hypertension). The judges suggested modifications and how adjustments were made. After the finalization, the supporting material was made available on the "support material" icon and in the virtual library, in PDF format, and through the ISSU virtual magazine format, as shown in Figure 2.

Figure 2 - Support Material Screen "Integral Care for Individuals with Systemic Arterial Hypertension using the Virtual Learning Environment".

Source: Research data.

In addition, other complementary materials such as: scientific articles, guidelines of the Brazilian Society of Cardiology, Guide Line of the State Health Department of Minas Gerais, among others, have been made available on the "Virtual Library" icon.

Step 3: Course development

The data collection took place during the course development, which was carried out in two face-to-face meetings, and by the Moodle platform. At the first meeting, the participants were invited to participate in the research, as well as clarified about the objectives and, later, they signed the Free and Informed Consent Form. Participants were guided and trained, with the support of the technician of the Center for Open and Distance Education (CEAD) of UNIFAL-MG and a distance tutor during the first meeting, for access and navigation in AVA on the Moodle platform. The tutor asked the participants to fill out the profile and a simulation of the tools used in the course, forum and wiki, was performed to clarify possible doubts. The tutor has a significant role in the construction of knowledge and assumes the role of mediator of information through feedback, which interacts with prior knowledge, promoting learning[14].

At the beginning of the course, besides the motivational video and the Virtual Library, the activity schedule and a "Coffee with Prose" forum were made available, with a function of exchange

between the participants and the tutor, to clarify doubts and discussion. The first activity proposed was a clinical case study, which had systemic arterial hypertension as a priority concern for comprehensive care for SUS users. Then, a discussion forum followed by a *wiki 2* was conducted. The collaborative construction of the wiki was verified by Content Analysis through pre-analysis, exploration of material, and treatment of results by inference and interpretation[15].

Step 4: Closing meeting and course evaluation

The evaluation of the course by the participants occurred in two moments. At first, the evaluation was carried out through the application of a semi-structured questionnaire, prepared by the authors themselves, on the difficulties and facilities experienced in the use of AVA and in the construction of the collaborative text through the wiki. This evaluation was carried out in order to know the impressions of the participants regarding the course and to make possible adjustments that were necessary. At the end of the course, a closing meeting was held and the participants were divided into two groups, with 10 participants, to carry out the focal group, as a method for data collection. Participants were directed to the UNIFAL-MG Qualitative Research Laboratory. The focus group was conducted by a researcher, with experience in the application of this technique, from the questioning "How did you participate in this course?" The researcher participated as moderator to encourage and guide the testimonies, so that everyone present participated in the discussion.

For the qualitative analysis of the data, the speeches were transcribed, read and analyzed, using content analysis, thematic modality. An exhaustive reading of all the material obtained was made to allow the immersion in the data to show its categorization, from the highlight of themes or recurrent patterns. The categories of analysis were grouped by affinity. After categorizing the data, the themes were submitted to a specific analysis, with the re-reading of each category and the construction of sub-themes. The immersion in the sub-themes allowed the deepening and analytical understanding[15].

The research was approved by the Research Ethics Committee of the Federal University of Alfenas – UNIFAL - MG, under the protocol number 010/2011, and it is in accordance with the Guidelines and Norms Regulating Research involving human beings.

RESULTS AND DISCUSSION

To promote integrality as an axis of training in an interdisciplinary proposal, it is necessary to integrate knowledge, theory and practice, technical skills and critical thinking in defense of health promotion [16]. In this way, participants were asked to construct a hypertext in a collaborative way to solve case studies, with their previous knowledge, through the wiki tool. Two case studies were carried out, and the topic covered in wiki 1 and 2 was caring for the person with hypertension. Participants were asked to identify the main health problems and needs and to carry out resolutive interventions. The interdisciplinary health problems / needs covered the courses of nursing, pharmacy, dentistry, nutrition and physiotherapy.

On wiki 1, the participants identified numerous problems and health needs, but the patient in case 1 had a hypertensive peak and, despite the immediate importance, this problem was raised by only one participant. Other relevant issues related to clinical guidelines or care protocols were not listed by any participant. Another point observed was that the construction of wiki 1 occurred in isolation, each student complemented the speech of another, with little interference in the previous speech. The wiki, as a collaborative tool for collective knowledge construction, allows a text to be edited freely by any of the participating subjects. That is, it is allowed to edit the speech of the other, in a collaborative and interdisciplinary way. In case 1, as shown in Figure 3, it was identified that the participants worked in isolation, in which each one only inserted "pieces" or complemented the previous speech, being perceptible the fragmentation of the care, in which each professional contributed only with vision of vocational training.

Figure 3 - *Wiki* 1: Case Study 1 - Comparison between version 1 and version 2.

Source: Research data.

Interventions were carried out, after *wiki* 1, through the forum, whose purpose was to base knowledge on the topic Hypertension. It was requested, as an introductory activity, the reading of the material of support. Then, the forum was opened for discussion and clarification of doubts regarding the content. Subsequently, articles related to the topic "integrality of care for hypertensive patients" were inserted and the discussions were carried out. During the process of teaching and learning, the forum is a support resource that provides a space for discussion and exchange of information, to assist in the construction of knowledge, besides being a space for the externalization of perceptions and criticism [11]. It is important to emphasize that during the whole process, the tutor acted as mediator, trying to articulate and stimulate the discussion. As a last activity, a second clinical case study, similar to the first one, was developed for *wiki* 2 construction.

Then *wiki* 2 was opened, similar to the first. On wiki 1, it was evidenced the fragmentation of care by professional categories and on wiki 2, this did not happen in an evident way. The participants constructed the collaborative form as they made and reworked the previous speech, constructing and deconstructing writings to finalize a common text, capable of solving the health problem cooperatively. Figure 4 shows the comparison between version 1 and version 2 of the study of case 2, demonstrating the interconnection of knowledge, in which participants rewrite each other's speech.

Figure 4 - Wiki 2: Case Study 2 - Comparison between version 1 and version 2.

Source: Research data.

The participants managed to articulate the integration of the care offered to the user by the different professional categories. Despite the difference in areas of knowledge of these categories (dentistry, nursing, nutrition, physiotherapy and pharmacy), the group was able to establish, jointly, an integrated therapeutic project. Participants deepened the discussion about the health problems and health needs of the user, which were evident throughout the construction. In this way, we noticed a maturation of the participants in the integration of the elaboration of the care, offered by the different professional categories, justifying, then, an initiative to promote the interdisciplinarity and the integrality of the care to the user in question.

The evaluation of the course, by the focus group, allowed to deepen the questions related to the object of study, through the discussion among the participants. It was possible to identify four categories of analysis, being: facilities experienced during the course; difficulties experienced during the course; face-to-face versus distance-learning course; *wiki* and forum: facilitating tools in interdisciplinary training in health.

Participants report the ease of doing their own study time with the convenience of not having to leave home, which gives them greater security. The Moodle platform was highlighted as an interesting tool for the exchange of knowledge, in which the course design was detailed and facilitated navigation. The didactic material was cited as a guide of the study, with a clear and objective language, with a multidisciplinary approach, which encompassed all health professions, with a nice graphic design.

Although the students mentioned facilities in relation to the Moodle platform and the Moodle *wiki* tool, it was reported that until they became familiar with the environment, they expressed doubts about the use of these tools. The difficulty in getting involved was also perceived, since it was a strategy of teaching totally different from those already experienced; however, as activities were performed, they were able to feel involved in the platform.

One discussion that took place between the participants during the focus group was on the differences between face-to-face and distance-learning. It was pointed out that, although there were few face-to-face meetings, when compared to traditional teaching, there was much more discussion in distance learning than in face-to-face teaching. Participants agreed that face-to-face teaching is rooted in their culture, but that distance and face-to-face teaching should complement each other in an articulated way. In this way, it is noticeable that there are challenges in the exploration, more and more efficient and adequate of the presential moments and non-presential moments, in which no distinction is made between a "form" or "modality" of education, but by the means used in the teaching and learning process[4].

The Wiki and Forum tools were pointed out as tools that aid in the interdisciplinary formation in health, since they allow the collaborative construction of knowledge. The discussion forum allowed creating a flexible and collaborative learning environment, capable of stimulating the participants' autonomy, as well as considering them as active subjects of the process. The discussion forum is an environment of intercognition, which is strengthened when the interlocutors engage, committing themselves to the course and the quality of the discussion, through the insertion of pertinent contents[17]. It was possible to notice that interdisciplinarity was present in the forum.

"There was a moment in the forum that one student from the pharmacy was talking to another one from nutrition and shared their knowledge."

Regarding the *wiki*, the participants considered the tool interesting, especially for the freedom it provided, in which one complemented the other one and, in the end, concretized a complete writing. In addition, one of the participants mentioned the importance and the desire to work with a similar tool that would allow a multidisciplinary report on the practical experience of the supervised internships.

"This fact of people who are writing together, I think this is very motivating, very interesting (Participant 8)."

"Because… in the end, it turned into a complete essay (Participant 12)."

"Primarily for the freedom to correct something that the person wrote there, and for adding. Because, if it were a tool that you could only send a data and could not delete the other one's or give continuity, it would not be necessary (Participant 18)".

It is important to emphasize that these tools, *wiki* and forum, allow the situated and collaborative learning. The construction of knowledge supported by the collaborative perspective is based on the collaborative attitude of the peers who act within the system. It recognizes that there is a collective intelligence that operates at all levels to maintain the dynamicity of the system and thus to enable the emergence of new knowledge[18].

In this way, learning, supported by *wiki* and forum tools, can be considered as a process of social interaction, of the capacity for cooperation between participants in search of solving common problems.

FINAL THOUGHTS

The Virtual Learning Environment and its resources present a new paradigm in education, in which the use of technologies enables and aids in the didactic process, through interactive resources capable of stimulating critical-reflexive thinking. The discussion forum can be legitimized as a dialogic and intercognition context, in which the presence of the other is motivating and challenging to incite new propositions, so that each incorporates the statements of others for the development of their own.

It was verified, from the evaluations carried out, that the teaching and learning strategies, mediated by the Virtual Learning Environment, were considered an important tool for the interdisciplinary and integral formation in health, reaching the objectives outlined in this work. However, in spite of the result of this study, it is essential to highlight as a limitation, the need for the continuity and deepening of studies correlated to the theme.

At the end of this study, it was verified that there are still conditions to be overcome to improve the quality of professional training and, consequently, to improve the quality of the service provided to the population from the point of view of interdisciplinarity and integral care.

More than provoking reflections and making proposals, this research presented possibilities in the search for new educational strategies focused on professional training in the context of the Unified Health System. It is expected that the students will be able to develop skills for the acquisition of competences, besides new approaches to teaching and learning.

Finally, this research contributed to the reflection of educators and students to build knowledge from new possibilities, thus enhancing educational practices in higher education. After the conclusion of this study, the perspectives of continuity of implementing this initial project remain, to adapt it to the social demands for an emancipatory education of the subjects. It is suggested that the creative spirit be always present in the pedagogical practice and in the elaboration of new educational technologies, not only to anchor the teaching and learning process but, above all, to the adequate training of future health professionals.

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