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INSTRUCTIONAL DESIGN IN NURSING: ASSISTIVE TECHNOLOGIES FOR THE BLIND AND DEAF*

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ABSTRACT

The present study provides a reflective analysis on the development of online assistive technologies that support nursing care for people with disabilities, based on Falkembach's instructional design model. Reflective study conducted in April 2018 through the online institutional repository of the Graduate Program in Nursing of Universidade Federal do Ceará. Studies on technologies from the last five years involving people with sensory disabilities were selected. Four studies on the construction of online assistive technologies were analyzed, and three courses and one educational leaflet addressed prevention and health promotion in breast health, high blood pressure, sexual and reproductive health and prevention of sexual violence with accessible and inclusive language. It was concluded that nurses should use rigorous and effective methods in the construction of assistive technologies, observe all the steps the model, avoiding errors and optimizing results.

DESCRIPTORS: Nursing; People with Disabilities; Distance Education; Self-Help Equipment; Health education.


Article extracted from the following dissertations and thesis: "Breast cancer detection training for blind women: affordable online course development and evaluation", Universidade Federal do Ceará; 2013; "Construction of assistive technology about condom use for the deaf", Universidade Federal do Ceará; 2015; Construction and assessment of assistive technology as online course for the blind about hypertension prevention", Universidade Federal do Ceará; 2015; "Virtual educational leaflet on sexual violence prevention: health promotion for blind individuals", Universidade Federal do Ceará; 2017.


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DESIGN INSTRUCCIONAL NA ENFERMAGEM: TECNOLOGIAS ASSISTIVAS PARA CEGOS E SURDOS

RESUMO

Este estudo apresenta análise reflexiva sobre desenvolvimento de tecnologias assistivas online, que subsidiam o cuidado de enfermagem à pessoa com deficiência, com base em modelo de design instrucional de Falkembach. Estudo reflexivo, realizado em abril de 2018, através do repositório institucional online do Programa de Pós-Graduação em Enfermagem da Universidade Federal do Ceará. Selecionaram-se pesquisas sobre tecnologias dos últimos cinco anos envolvendo pessoas com deficiência sensorial. Foram analisadas quatro pesquisas de construção de tecnologias assistivas online, sendo três cursos e uma cartilha, sobre prevenção e promoção da saúde na saúde mamária, hipertensão arterial, saúde sexual e reprodutiva e prevenção da violência sexual com linguagem acessível e inclusiva. Concluiu-se que o enfermeiro deve utilizar métodos rigorosos e eficazes na construção de tecnologias assistivas, obedecer às etapas do modelo, evitando erros e otimizando resultados.

DESCRITORES: Enfermagem; Pessoas com Deficiência; Educação a Distância; Equipamentos de Autoajuda; Educação em Saúde.

DISEÑO INSTRUCCIONAL EN ENFERMERÍA: TECNOLOGÍAS PARA LA ATENCIÓN DE CIEGOS Y SORDOS

RESUMEN:

Estudio que presenta un análisis reflexivo sobre el desarrollo de tecnologías de atención online que respaldan la atención de enfermería a las personas con discapacidades, en base al modelo de diseño instruccional de Falkembach. Estudio reflexivo, realizado en abril de 2018 utilizando el repositorio online institucional del programa de posgrado en enfermería de la Universidad Federal do Ceará. Fueron seleccionadas investigaciones sobre tecnologías de los últimos cinco años en referencia a personas con carencias sensoriales. Se analizaron cuatro estudios de construcción de tecnologías de atención online: tres cursos y una libreta sobre prevención y promoción de salud en salud mamaria, hipertensión arterial, salud sexual y reproductiva y prevención de la violencia sexual con lenguaje sencillo e inclusivo. Se concluyó en que el enfermero debe utilizar métodos rigurosos y eficaces en la construcción de tecnologías de atención y respetar las etapas del modelo, evitando errores y optimizando resultados.

DESCRIPTORES: Enfermería; Personas con Discapacidad; Educación a Distancia; Dispositivos de Autoayuda; Educación en Salud.

INTRODUCTION

The impact of new information and communication technologies is perceived worldwide, especially regarding the organization of information and construction of knowledge⁽¹⁾. This technology scenario has favored the development of health and nursing care and assisted the teaching-learning process in this area⁽²⁾.

Given the different modes of acquisition of knowledge and the different needs of interaction for learning of the subjects, it is necessary to reflect on the development of educational materials that address the specificities of the target audience⁽³⁾, including people with disabilities because of their social vulnerability.

Assistive Technologies constitute scientific evidence on the construction of accessible digital materials for people with sensory disabilities. Through the use of Instructional Design principles in the development of health education materials, instruction and content are developed to benefit people in all learning modalities without adaptation or modernization, including students with and without disabilities⁽⁴⁾. This requires a rigorous pedagogical planning.

In addition to counting on innovative digital technologies, it is necessary to invest in the critical-reflexive exercise to improve the educational practices in nursing targeted to individuals with disabilities, to motivate and engage students, enhancing the construction of knowledge.

Therefore, the present study aimed to present a reflective analysis on the process of development of online assistive technologies that support nursing care for people with disabilities, using an instructional design model.

METHOD

The online assistive technologies presented at the Graduate Program in Nursing of Universidade Federal do Ceará, regarding the inclusive instructional design model and inserted in the institutional repository, were accessed in April 2018.

Assistive technologies developed over the past five years for people with sensory disabilities were included in the study. Technologies associated with other types of disabilities were excluded.

The selected material was read, and a reflective analysis was made on the development of assistive technologies associated with the model proposed by Falkembach and nursing care that use safe and accessible technological innovations in health.

DEVELOPMENT OF ASSISTIVE TECHNOLOGIES ASSOCIATED WITH THE INSTRUCTIONAL DESIGN MODEL PROPOSED BY FALKEMBACH

Reflective study uses the instructional design model proposed by Falkembach that includes five phases, as follows: Analysis and Planning, Design, Implementation, Evaluation and Maintenance, and Distribution⁽⁵⁾.

The Analysis and Planning Phase involves product characterization, definition of the target audience, theme, presentation form, site of application, resources available and necessary, definition of the purpose and the desired outcomes.

In the design phase, technologies were organized in order to be attractive,

understandable and usable before they were constructed, through the conceptual model (detailing of displayed content and type of user interaction), navigation (access structures such as menus, indexes, and guides), and interface (harmonization of content navigation system)⁽⁵⁾.

The Implementation covered the creation and implementation of media, including sounds, images, animations and videos, using specific software, allowing integrating the media into an interactive structure with logical and intuitive user navigation⁽⁵⁾.

The Evaluation and Maintenance phase was characterized by tests and thorough verification of the content presented, and occurred throughout the five phases of the model to make improvements in technology quality. In the Distribution phase, the materials were inserted into the devices for use⁽⁵⁾.

Thus, the development of assistive technologies was related to the instructional design model. The main points that have a direct impact on the accessibility of educational materials for the health of people with disabilities are emphasized in Table 1, below.

Table 1 – List of Assistive Technologies associated with the Instructional Design Model proposed by Falkembach. Fortaleza, CE, Brazil, 2018

Assistive Technologies	Falkembach's Instructional Design Model
Online Course on Breast Health ⁽⁶⁾	Target audience of Blind and non-Blind Women Easy-to-understand language and storyboard. Definition of menus, links, text box, audio, image description, background color, color and font size. Available on AVA1 ^[1] Moodle®. Elaboration of five didactic modules. Checking of content and accessibility errors in ASES.
Online course about Arterial Hypertension ⁽⁷⁾	Target audience of blind women and men. Content with simplified vocabulary. Guide for text organization, multimedia and forums. Construction of the web pages of the course and storyboard in HTML ^[2] . Available on AVA Moodle®. Elaboration of six didactic modules. Checking of content and accessibility errors in ASES.
Online Course on Sexual and Reproductive Health: Condom Use ⁽⁸⁾	Target audience of deaf women and men. Accessible language content and in Brazilian Sign Language (Libras), through videos and subtitles. Guide for text organization, multimedia and forums. Construction of the web pages of the course and storyboard in HTML format. Available on AVA Moodle®. Elaboration of four didactic modules. Checking of content and accessibility error in ASES.
Virtual Educational Leaflet on Sexual Violence Prevention ⁽⁹⁾	Target audience of blind women and men Content construction based on focus groups. Single image with audio description for easy navigation. Audio description tool and text box. Elaboration of seven didactic modules. Checking of content and accessibility errors by the audience.

^[1]Virtual learning environment

^[2]Hypertext Markup Language

The phases of the proposed model were adapted to meet the needs of the target audience. Special aspects of blind and deaf communication have been associated and the digital materials were assessed with the use of international internet accessibility guidelines entitled Web Content Accessibility Guidelines (WCAG) and national internet accessibility guidelines, through the E-Government Accessibility Model (e-MAG)⁽¹⁰⁻¹¹⁾.

INSTRUCTIONAL DESIGN IN NURSING EDUCATIONAL TECHNOLOGIES FOR THE BLIND AND DEAF

The educational model with direct instruction approach or distance education favors the exchange of knowledge and sensitization of blind and/or deaf people about health content. Developing virtual technologies for educational purposes is important because these technologies represent the future of education technology, aiding the teaching-learning process⁽¹²⁾. This model has facilitated the development of content pages, constituting a means of quick access to information about the topic for the target audience⁽¹³⁾.

In addition to being aware of accessibility standards for the construction of digital materials, health professionals must approach their clients in order to know their peculiarities and real health needs. Educational technologies must include specific properties to be used by these people and effectively promote health in aspects that cause greater vulnerability⁽¹⁴⁻¹⁵⁾.

The elaboration of Assistive Technologies is a way to provide new experiences in the teaching-learning process. These technologies stimulate the interest of people with sensory disabilities in health care topics, addressed through didactic modules structured in a dynamic, attractive, organized and effective manner. They have accessibility criteria, enable autonomy and use of adequate means to obtain new knowledge about health. Nurses must master the health content relevant for the users, as well as educational technologies accessible to people with limited communication.

Investments for the technological development of nursing care are crucial, and it is necessary to incorporate the principles of the model in the area of nursing, to ensure safe, effective and inclusive technological innovations.

Studies that use this model applied to the area of nursing care to individuals with disabilities are still scarce. Therefore, a reference for the development of digital technologies, minimizing errors and costs enables the elaboration of accessible and valid tools for nursing teaching and care.

Nursing care directed to people with disabilities must meet the requirements imposed by public policies. In order to expand the access of this population to health promotion actions, it is necessary to train health professionals and make them aware of the relevance of producing accessible educational materials.

It is possible to improve knowledge, empowerment, and social and digital inclusion related to changes in physical, personal and social resources, with emphasis on behavioral changes to provide comprehensive and high quality health care⁽¹⁶⁻¹⁷⁾.

FINAL CONSIDERATIONS

Assistive technologies based on the model proposed by Falkembach allow adjustments to meet the needs of the blind and deaf. Inclusive digital educational materials using rigorous and effective methods allow the achievement of the proposed goals without

risk or harm to users. Therefore, they contribute to the advancement of inclusive health education, through tools and resources that promote effective learning.

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