

Educational technology “Anatomy and Vital Signs”: Evaluation study of content, appearance and usability



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ABSTRACT

Background: The use of new technology has recently grown considerably as an increasing number of college students using Internet. In nursing education, the personal computer and the Internet facilitate teaching theoretical and practical knowledge.

Objectives: Evaluate an educational technology known as Anatomy and Vital Signs with respect to content, appearance and usability.

Method: This was a first stage evaluation—by specialists to verify content and functioning, prior to a second validation as to learning by students. A methodological study in which instructional technologists (11 participants) and nursing specialists (17 participants) used the technology in an unguided manner and completed three questionnaires. The evaluation was measured by the difference between disagreement and agreement for each statement in the questionnaires.

Results: Most of the items were positively evaluated at a level higher than 70% by most of the evaluators except for the following usability criteria: grouping by shape, minimum actions and user control, which did not attain the 70% agreement level among instructional technologists.

Conclusion: The evaluation was useful to improve the technology and guarantee suitable product for nursing education. It may be a reliable educational tool for nursing education that applies technological resources.

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1. Introduction

Nowadays, nursing instructors teach a generation of students known as Net Generation because they matured in the media-saturated environment referred to as the information era [17,25,33] and are considered multi-taskers.

In nursing education, web-based learning is a popular means to enhance face-to-face lessons and can be considered to represent a collaborative learning environment [13,15,7,32]. Understanding the scientific and technological foundations of the field can be simplified for the students by linking theory and practice [5,9,10,22].

This article focuses on the evaluation of educational technology for nursing education known as “Anatomy and Vital Signs”, developed to be used by nursing students.

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When developing educational technologies for human-machine interactions, it is important to consider three basic characteristics: ergonomic, technical, and aesthetic quality [21].

We use the definition of ergonomics as the science of man knowledge and application in the construction of tools to facilitate the overall performance [11]. In addition there is the usability. According to the ISO 9241 (2008), usability is measured by the effectiveness, efficiency and user satisfaction, i.e., the range of extension of the proposed objectives regarding the use of resources to be spent to achieve the desired goals.

In this study, we used the usability criteria defined by Dominique Scapin which have been widely used to evaluate software for commercial or educational purposes: conduction, workload, explicit control, adaptability, errors management, consistency, compatibility and meaning of codes and denominations [11].

Participation of specialists for the assessment of educational technology should be considered because a broad validation of the construct can ensure a more robust and suitable instrument for use [27].

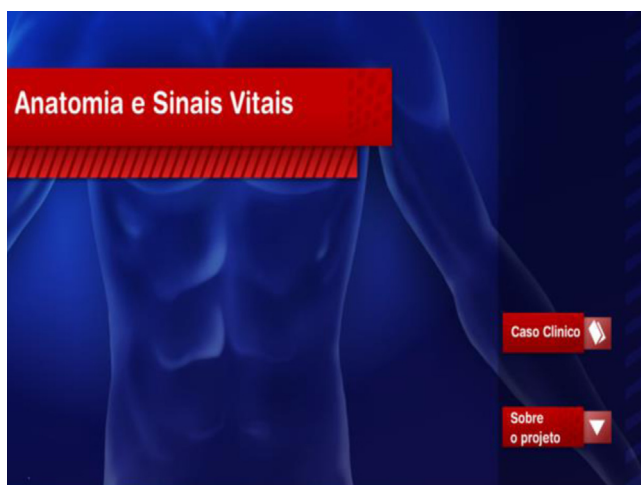


Fig. 1. Initial screen of “Anatomy and Vital Signs”.

Source: The authors.

The evaluation of aesthetic quality of the interface has been carried out by some studies in nursing from the use of specific instruments such as Reeves scale [4] and Cluine [15]. Studies have been concerned to assess the ease of navigation, design, compatibility, information presentation, aesthetics, and functionality [4,29,15], as well as the pedagogical aspects [4,15,2].

All identified publications emphasized the importance of evaluation/validation of educational technology in search of a motivating and interactive pedagogical relationship since the previous analysis of the developed product demonstrated needs adjustments which could hinder learning.

Considering that educational technologies can be used in teaching nursing, the lack of validated/evaluated materials for technical and pedagogical issues and appropriate use in nursing education is that we aim to evaluate an educational technology known as “Anatomy and Vital Signs” with respect to content, appearance and usability.

1.1. Educational technology “Anatomy and Vital Signs”

It is a clinical case simulation that presents the history of a patient in an educational game format (a health unit scenario) with simulations of five care actions related to the subject of anatomy and vital signs, a total of seven questions (Figs. 1 and 2). The user, who is represented by a virtual professional, observes the situations and chooses an alternative, which tests the provided learning. The user has an opportunity to create a nursing record of the actions that were taken and to share the record on a social network. The technology is constructed in a modular fashion; the user can navigate throughout the educational game and access the issue of interest.

The simulations use multimedia, such as heart and lung sounds and drawings with internal visualizations of the heart, lung, and brachial artery (Fig. 3). There is also a brief presentation on the possible anatomical and functional changes related to the patient’s illness, which have been prepared as an additional resource to support the user’s learning in an attempt to articulate the issues of theory and professional practice (Fig. 4). The “Anatomy and Vital Signs” technology is available free of charge on the Internet (<http://www.sinaisvitaisenf.com.br>).

The educational technology “Anatomy and Vital Signs” was developed from problem-based learning Woods, [34]. All of the technology’s development phases were performed with students and teachers in an effort to enable the student to perform the mediation between the technical and content knowledge.

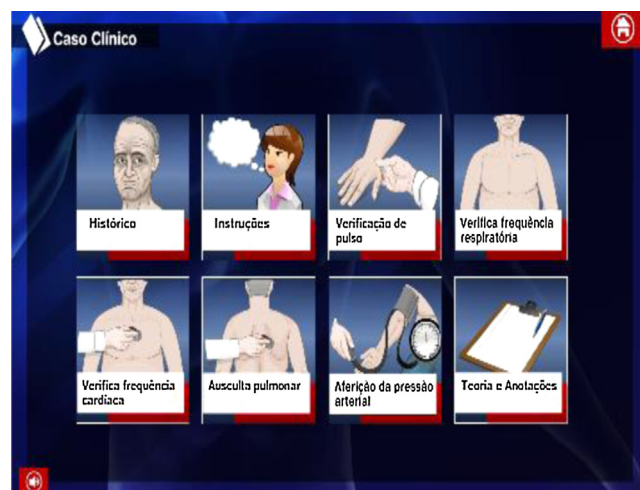


Fig. 2. Presentation screen of the “Anatomy and Vital Signs” modules.

Source: The authors.



Fig. 3. Blood pressure measurement simulation screen.

Source: The authors.

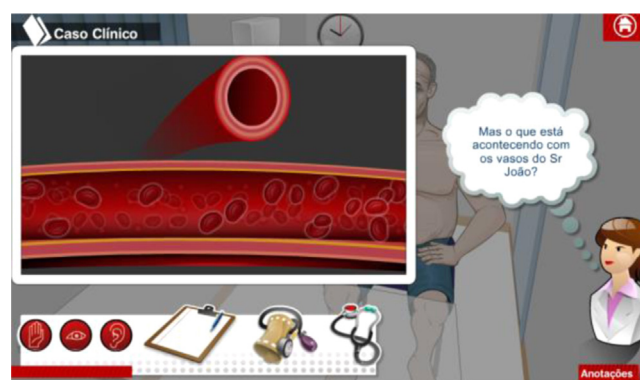


Fig. 4. Presentation screen of theoretical content related to the clinical case.

Source: The authors.

The importance of providing situations in which students can add and incorporate information to previously established knowledge was also considered, which makes learning meaningful [6,14,1].

We also use the theoretical framework of human computer interaction (HCI) that relates to computer science, arts, design, ergonomics, psychology, sociology, semiotics, linguistics, and related areas. The interaction between humans and machines occurs through the user interface consists of software and hardware [30].

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