TECHNOLOGY FOR EDUCATION OF SEXUALLY TRANSMITTED DISEASES: HYPERMEDIA VALIDATION

Tecnologia para o ensino das doenças sexualmente transmissíveis: validação de hipermedia

Descripción: describir el proceso de validación de una hipermedia educativa junto a los especialistas de las áreas de enfermería e informática. Método: estudio metodológico, realizado en los meses de marzo a agosto de 2013. Los participantes de la muestra fueron seleccionados por conveniencia del tipo “bola de nieve”. Se utilizó la escala Likert para evaluación de los ítems (contenido, relevancia, ambiente, funcionalidad, usabilidad y eficiencia) y se adoptó el índice de validez de contenido (IVC) igual o mayor 0,80 como pánclad para establecer la excelencia de la validez. Resultados: la hipermedia fue considerada adecuada por los especialistas para ser aplicada como recurso auxiliar de enseñanza durante la formación de enfermeros. Obtuvo más 80% de concordancia en las respuestas de los especialistas en los ítems evaluados. Conclusión: se hace necesario la aplicación con grupos de estudiantes para verificar la aceptación de la propuesta pedagógica y el acompañamiento del rendimiento académico. Descriptores: Enseñanza de Enfermería; Estudios de Validez; Hipermedia; Tecnología Educativa; Enfermedades Sexualmente Transmisibles.
INTRODUCTION

Advances in information and communication technologies (ICT) and the expansion of the internet broke the geographical and temporal barriers of access to education. These facts are transforming the teaching methodology, the role of the teacher and how to learn from the students. In this direction, there is a generation of students who are developing new ways of perceiving and learning since grown in multimedia environments with different expectations and worldview of previous generations.

Teaching and Research in Nursing have sought to adapt to the advances of technology in education. In Brazil, due to the growing demand for specific skills and knowledge, many undergraduate courses are already using digital objects as an education strategy. Based on this context, the Program of Graduate Nursing of the Federal University of Ceará (UFC) in partnership with the Academic Center of Vitória of the Federal University of Pernambuco (UFPE), developed the hypermedia “Nursing and Sexually Transmitted Diseases (STD)” using a virtual environment as a theoretical strategy for the training of nurses.

Hypermedia is understood by the meeting of various media in a computer support, connected by electronic communication systems that allow students to browse the available information freely, which increases interactivity and makes the user an active participant.

There is interest in validating hypermedia to verify the relevance of the developed items and determine the actual extent to which educational technology is designed: the teaching of STD in the undergraduate course in Nursing. Given the above, the study was guided by the following question: What is the suitability of hypermedia as a resource teaching aid to facilitate learning about STDs?

The validation process is based on a useful judgment in making decisions, providing the researcher certain guarantee that their choices will be effective and, in short, validated. Therefore, the validity represents the universe of content or domain of a given construct, which provides the structure and basis for formulating issues adequately represent the content.

It is increasingly common to use independent experts group to validate new educational technologies. The expert analysis is important because they will measure each item about the corresponding domain and judge if those items represent the content of the specific domain. However, it is essential that specialist is experts in the construct of the area to adequately assess the submitted relevance of each item.

When considering the aspects mentioned above, it is relevant to carry out a study with the aim of describing the validation process of an educational hypermedia together with experts from the areas of nursing and information technology. With this, the aim is to contribute to a further proposal for teaching in an active methodology based nursing undergraduate students to provide students greater autonomy and improvement in the teaching and learning about STD.

METHOD

Methodological study, which is the research of methods for collecting and organizing data and conducting rigorous research for development, validation and evaluation tools and research instruments.

During the months of March to August 2013, the hypermedia was assessed individually by experts working in the fields of nursing and information technology, encompassing the evaluation of content and technique, respectively.

The content experts were defined from adapted parameters o the Fehring Validation Model, focusing on expertise in gynecological and obstetrical nursing or sexual and reproductive health, especially with experience in addressing sexually transmitted diseases. To be included, nurses should obtain a minimum score of five points of the criteria described in Figure 1.

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Concomitantly, the technical experts should meet at least three points of the adapted criteria\textsuperscript{10} as outlined in Figure 2. For the selection, professionals with experience in information technology, programming and/or website production were considered.

It is stressed the difficulty of capturing the experts.\textsuperscript{16} There were 16 content experts, and 06 computer experts asked to participate. Of them, 12 met all the required tools corresponding to the final sample.

Participants in the sample were selected for the convenience of the “snowball” (sampling network or chain). In this approach, the researcher is looking for a specialist who has the required characteristics for the sample and asked to indicate others who meet the eligibility criteria.\textsuperscript{6,11}

In the case of agreement, information about the study, evaluation questionnaires, login and password to access hypermedia in SOLAR learning platform were sent (http://solarpresencial.virtual.ufc.br/).

To collect data, the experts used questionnaires adapted from studies\textsuperscript{10,12-3} developing educational technologies, plus the observations of the ISO 9126 and 14598 standards dealing with product quality and evaluation of software product, respectively.

For assessment of each item of interest, Likert scale was used with scores of concepts ranging from one to four: 1 = inadequate; 2 = barely adequate; 3 = quite adequate; 4 = very appropriate. At the end of the questionnaire, space was reserved for the experts may add suggestions and recommendations for possible improvements of hypermedia.

The content validity index (CVI) was adopted as a standard to establish the excellence of validity. This ratio indicates to what extent the opinions of experts are congruent and measures the proportion or percentage of experts who are in agreement on certain aspects of the built material.\textsuperscript{6,14-5}

After returning the questionnaires, the score of the IVC is calculated by observing the items considered relevant by the experts. The agreement of the items that were marked by “3” (very appropriate) and “4” (very appropriate) was added to the total number of responses (14).

It was considered validated items with equal or greater CVI 0.80 (14-15). Also, Phi and Cramer’s V concordance test was applied to verify the inter-judge agreement. 0.05 significance level was standardized.

The data were organized in a spreadsheet of Microsoft Office Excel 2007 program and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 that enabled the presentation of data in absolute and relative frequency, mean, median and standard deviation.

The research was approved by the Ethics Committee of the Federal University of Ceará/CEP/UFC, under opinion 191,533 and 06339612.8.0000.5054 CAAE. The ethical aspects of research involving human beings were considered as recommended by Resolution 466 of December 12, 2012, by the National Health Council.

**RESULTS**

Technical experts were male (100%) with a mean age of 36 years old (SD=4.58). They
obtained an average of 6 points (SD=1.73) of the criteria adapted for the sample selection.

As for content experts, there was a predominance of females (100%), and balance in the titration of the level of masters and doctoral (55.57% and 44.43%, respectively).

Regarding occupation, most content experts were active in educational institutions in the Northeast, especially in the federal public universities (66.66%) represented by the Federal University of Ceará/UFC, Federal University of Pernambuco/UFPE, Federal University of Campina Grande/UFGC, Federal University of Paraíba/UFPB and Federal University of Sergipe/UFSE.

All content experts had clinical practice (100%) and teaching experience (100%) in the study area. It was similar to the proportion of experts who reported participating in groups or research projects (88.88%) and guided academic papers (88.88%) related to the theme.

The average age of content experts was 38.67 years old (SD=8.83), the minimum age was 30 years old, and the maximum was 54 years old. The training time average was 13.33 years (SD=9.34), the minimum time of training observed among experts was 03 years and a maximum of 29 years.

Regarding adapted scores in the scoring system, content specialists obtained an average of 10 points (SD=1.50) with a minimum of 7 points and a maximum of 12 points.

The validation results showed that hypermedia is suitable to be applied as an aid to teaching about STDs for nursing students.

Regarding content, there was a content validity index (CVI) greater than 0.80 in all evaluated and presented agreement items (test Cramer’s V) in all the participating experts (Figure 3).

<table>
<thead>
<tr>
<th>Judged criteria</th>
<th>IVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational objectives</td>
<td></td>
</tr>
<tr>
<td>Clarity</td>
<td>1.00</td>
</tr>
<tr>
<td>Precision as to the expected behavior</td>
<td>1.00</td>
</tr>
<tr>
<td>Consistency with the displayed content</td>
<td>0.88</td>
</tr>
<tr>
<td>Content</td>
<td></td>
</tr>
<tr>
<td>Consistency with the theme and the goals</td>
<td>0.88</td>
</tr>
<tr>
<td>Updated and correct</td>
<td>0.88</td>
</tr>
<tr>
<td>Easy to read</td>
<td>1.00</td>
</tr>
<tr>
<td>Easy to understand writing for students</td>
<td>1.00</td>
</tr>
<tr>
<td>Usefulness of links and references to understand the subject</td>
<td>1.00</td>
</tr>
<tr>
<td>Relevance of media (images, sound, video)</td>
<td>1.00</td>
</tr>
<tr>
<td>Adequacy of the number of classes and topics</td>
<td>100</td>
</tr>
<tr>
<td>Appropriateness of the sequence of modules</td>
<td>0.88</td>
</tr>
<tr>
<td>Relevance</td>
<td></td>
</tr>
<tr>
<td>Line with the practice of caring nurse</td>
<td>0.88</td>
</tr>
<tr>
<td>Contribution to the learning and acquisition of knowledge</td>
<td>1.00</td>
</tr>
<tr>
<td>Importance of activities and forums for learning</td>
<td>0.88</td>
</tr>
<tr>
<td>Environment</td>
<td></td>
</tr>
<tr>
<td>Suitability for presentation of content</td>
<td>1.00</td>
</tr>
<tr>
<td>Encouraging student autonomy</td>
<td>0.88</td>
</tr>
<tr>
<td>Enables learning situations</td>
<td>1.00</td>
</tr>
<tr>
<td>Provides interaction student/student and teacher/student</td>
<td>0.88</td>
</tr>
</tbody>
</table>

Figure 3. Validity index on the judged criteria by the content experts. Fortaleza (CE), 2013

It can be seen in Figure 4 to validate the technical aspects of hypermedia.
The suggestions for improvement registered by the experts were implemented to better performance of hypermedia. Due to this fact and considering that these suggestions do not alter the hypermedia content, it was judged that there was no need for a new round of evaluation by experts.

**DISCUSSION**

The sample of experts proved to be able to evaluate hypermedia “Nursing and Sexually Transmitted Diseases”. According to Fehring, beyond the title, it is necessary that the expert has knowledge through clinical experience, scientific publications, and academic training. Thus, the higher the score is, the higher the strength evaluation of the evidence.

A review study aimed to identify the criteria for selection of experts in nursing research highlighted that the detailed description of the selection criteria set up a fundamental step to ensure the reliability of the findings. Thus, it should be evaluated the experience, knowledge, skill and practice of each expert about what you want to validate.

Creating course/online class is not just about scanning texts since the educational technology resources have their language, principles and methods that make the process of teaching and learning dynamic and interactive, updated and close to the user’s reality.

Hypermedia developed addresses important aspects of the practice of nurses in the syndromic care of STD and it is in line with the profession assignments. Moreover, it contributes to learning and acquisition of knowledge with relevant activities and forums to reinforce the content.

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The control program of STD of the Ministry of Health recommends immediate treatment to prevent complications, sequels and stop the transmission chain. It calls syndromic approach based on identifying signs and symptoms recorded during the assessment of the user.

In primary health care, nurses exercise care, organizational and educational functions for the control of STDs. It should systematize care to ensure quality care, development of educational actions for prevention, guidance, treatment, counseling, offering tests and condoms, sexual partners approach and reporting of cases.

Learning to use the syndromic approach to STD during the undergraduate course, it is still a challenge in Nursing, which can contribute to perpetuating the chain of transmission of sexual infections in case of a failure care in the community. However, hypermedia showed up as an auxiliary strategy for the teaching of STD given the relatively limited number of clinical experiences of the students in primary health care.

Hypermedia can create the same dynamic of other traditional teaching strategies (directed study, group work, videos, demonstrations, etc.) enabling the exploration, critical reflection, repetition exercises centralizing the student in the learning process.

Studies developed hypermedia in virtual environments and digital learning objects.
considered that these technological tools contribute to effectively teaching process, interactive, innovative and collaborative.4,10,17,19-22

To equip and assist in the understanding of the subject, several features were inserted in hypermedia, such as hypertexts, images, podcast, videos, case studies, portfolio and asynchronous tools (e-mail and discussion forum).

Researchers also used features of images, animations, audio and inserting links to appear in the virtual environment of learning module for the purpose of helping students to deepen their knowledge on the subject under study.4,17

The digital learning environment should contain specific educational activities and structurally different situations in classroom spaces. Therefore, it requires models adapted to this reality. It should be considered the message quality of the media since they have the function of cognitive operators, useful to draw attention and facilitate learning.4

The resource to be used will depend on several factors such as the content they want to teach, the user experience with the technology and network infrastructure (broadband or dial-up internet).17

It is noteworthy that poor planning in the presentation of multimedia material can cause disorientation, and even student demotivate them to engage in the proposed activity. Digital learning objects involve multiple senses simultaneously (images, sound and simulation experiments), and thus can accommodate a variety of learning styles at a level that few publications, readings, or even demonstrations could do.23

The style of language adopted at the interfaces of online courses should provide clarity, exposure simplicity, objectivity, and accessibility. It provides step-by-step instructions in the active voice, using short sentences and avoid abbreviations are the important features the language offered in these virtual environments.1,21,4

The highlight attribute of hypermedia is its interactive capability that arouses curiosity and interest of the student. The learning in the online context requires an active role of the student as the protagonist and builder of his knowledge, leaving him to control the choice of topics, the resolution of exercises and exchange of information between colleagues and teacher for doubts solution on the matter.25

The advantage of using HTML, or hypertext, is the ability to navigate quickly through a large amount of information. Hypertext offers a range of possibilities that allow the reader connects them according to their interests and needs, surfing and building their sequences and routes.24 In this sense, the use of different media and languages allows the user to “walk” freely by hypermedia, better using the content.1 However, is not advisable to show their content on a single screen, as this would cause too much information to the user, which could confuse them.23-24 The interface design should be pleasing to guide students and gain their attention. Concerning navigation, the student should be helped with tools that assist in the signaling information. The images and/or figures should be similar to objects that represent, and animations should offer opportunity to present concepts interactively.1

Study aimed to describe the steps to developing an ongoing virtual environment chose to use a limited number of resources and tools, to simplify the technical procedures and maximize the visibility and exploitation of content by students obtaining satisfactory results in learning from the students.24

The amount of content must be planned according to time and must be linked to the number of hours students devote to study, taking into consideration the amount of reading and how the student must see, hear and practice. The content should be structured in small units and communicate the need to reach the initially proposed objectives. It is the interaction of students with content that leads to understanding, perspective change and learning.1

Another study developed a hypermedia used a basic and standardized framework to stimulate students’ motivation. The titles were highlighted with increasing font and color for each topic, and the use of images was common, being selected according to their relevance to the topic.20

Researchers have developed virtual educational proposal concluded that the quality of teaching materials, the choice of platform support to education and the methodology adopted were the determining factors for the success of the project and the satisfaction of teachers and students in performing it.27

It is noticed that the application of virtual environments consistently learning and responsible in aid to traditional teaching has proven to be an efficient way to build knowledge, foster student autonomy in the pursuit and deepening of knowledge.17
Digital teaching materials will foster interactivity and knowledge production, characteristics that are fundamental to the effectiveness of the educational process if they are subsidized by pedagogical approaches.  

New technology has allowed the creation of multisensory educational environments, with different structures (games, simulations, distance collaboration, among others) and the ability to capitalize on access to knowledge.

However, it is agreed that no educational software and digital learning object are suitable or not for himself. Before, it is necessary to analyze the application that is made of technological resource, as it believes that it is this that determines the adequacy concurrently with the teaching proposal.

Given the above, online education requires both the teacher as the student greater dedication, digital fluency, and mastery of new techniques. Nowadays, teachers cannot ignore ICT, need to have technical skills to use digital tools efficiently, consolidating a new to teaching. For the educational process to succeed, we need to invest in teachers technological skills related to new forms of content creation and management of interactive teaching situations.

CONCLUSION

Hypermedia “Nursing and Sexually Transmitted Diseases” was validated by content and technical experts and deemed suitable as a teaching aid resource in undergraduate nursing collaborating thus with the process of training.

It is recognized that hypermedia constitutes an complementary educational strategy in undergraduate nursing and that further studies are needed to verify the acceptance of the pedagogical proposal and monitor the academic performance of nursing students to use this educational technology.

The development of new teaching materials should be encouraged by nursing teachers, specifically in the area of sexual and reproductive health, as there is a scarcity of publications on interactive and validated teaching materials that can promote and facilitate the teaching-learning process. There is government interest in controlling and preventing STDs in primary health care. It is expected therefore that these materials may have an impact on clinical practice and teaching of the nurse.

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