English

# Virtual Human Project And Interactive Learning Environments: New Educational Models In Health

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Abstract

*This article aims to demonstrate the applicability of new pedagogical architectures in a model of success developed by the Discipline of Telemedicine of the Faculty of Medicine of USP for health education. From the spaces developed for the Catavento Cultural and Educational Museum, we present new concepts of interactivity to be absorbed by the conventional format of communication and health education. The possibility of the individual's approaching to his reality not only by reason, but also by feeling, bringing the community closer to the individual.*

*Keywords: health; education; interactive learning environments; virtual man project; telemedicine; Interactive teleduction.*

Resumen

## Proyecto Hombre Virtual y entornos de aprendizaje interactivo: nuevos modelos educativos en salud

*En este artículo se pretende demostrar la aplicabilidad de nuevas arquitecturas pedagógicas en un modelo exitoso desarrollado por la asignatura de Telemedicina de la Facultad de Medicina de la USP para la educación en salud. A partir de los espacios desarrollados para el Museo Catavento Cultural y Educacional, se presentan nuevos conceptos interactivos para ser absorbidos por el formato convencional de comunicación y educación para la salud: la posibilidad de acercamiento de la persona a su realidad no sólo por la razón sino también por el sentimiento, trayendo a la comunidad más cerca de la persona.*

*Palabras clave: salud; educación; entornos interactivos de aprendizaje; proyecto hombre virtual; telemedicina; teleducación interactiva*

Resumo

## Projeto Homem Virtual e ambiente de aprendizado interativo: novos modelos educativos em saúde

*O presente artigo busca demonstrar a aplicabilidade de novas arquiteturas pedagógicas em um modelo de sucesso desenvolvido pela Disciplina de Telemedicina da Faculdade de Medicina da USP para educação em saúde. A partir dos espaços desenvolvidos para o Museu Catavento Cultural e Educacional, apresentamos novos conceitos de interatividade para serem absorvidos pelo formato convencional de comunicação e educação em saúde. A possibilidade de aproximação do indivíduo à sua realidade não apenas pela razão, mas também pelo sentimento, trazendo a comunidade para perto do indivíduo.*

*Palavras chave: saúde; educação; ambientes*

## INTRODUCTION

Education has been going through many transformations with the developments in science and technology. The educational model structured for centuries has now started to loose sense facing the new modern world. Students have now accesses to a huge amount of information in a fast and easy way. They may learn through technology resources, and teachers are no longer the only holders of knowledge.

The term 'literacy' was defined by the Organization for Economic Co-operation and Development (OECD) and Statistics in Canada in 1995 as the ability to understand and use written information in daily life, at home, at work, and at the community with the aim to reach personal goals and enlarge the knowledge and expertise acquired. According to Laure Endrizzi[1], the term is moving away from the historical perception associated to read/write/tell skills. It is starting to become known as a continuous process of knowledge, skills and strategies, adding the capacity to apply digital technologies and communication tools.

Endrizzi[2] refers to Douglas Kellner's quote about the need of a global vision in the educational refurbishment. Bringing more space to communication, creativity and applied skills, it defines the students as active and committed individuals. Thus, going beyond the division between the students' cyber culture and the authoritarian way of teaching based on the culture of printed materials legitimacy. Therefore, the joint between technologies and learning processes based on interactivity and interdisciplinary seems to be an interesting path to be followed.

Although the expression Distance Learning has been widely spread, the Discipline of Telemedicine of the University of São Paulo School of Medicine has been working on Education Supported by Technology models. It can be used to increase the students' learning efficiency in conventional education, as well as in education focused on distant located communities (interactive tele-education).[3]

One of the highlighted areas in educational technologies is the possibility to build interactive tools to help teachers in the educational process, as well as students' learning. We may quote the Virtual Human Project® (homemvirtual.org), which uses visual communication resources through 3D computer graphics to spread knowledge in a visual and dynamic way. It's a graphical portrayal of a huge amount of specialized information in a pleasurable, interactive, dynamic and focused way. Therefore, it turns into a precise translation of scientific knowledge with adapted communication to the target-audience. More than 3D anatomy, the Virtual Human is a tool showing detailed physiological processes, diseases' causes and effects, drugs' action, and surgical procedures.

Teachers can use it as an educational tool, saving time in lectures and improving the teacher-student communication. In the other hand, students itself may refer to the material as a complementary knowledge to the classes.

Edgar Morin's[4] quote that the teaching of an isolated discipline reduces the mind's natural ability to contextualize knowledge comes straight towards the developed concept for the Virtual Human Project®. It's not about teachers holding the whole knowledge to teach based on books written by medical doctors and scientists, and illustrated by passive designers. Instead, we have a multidisciplinary team working together in the search of a common goal: a new educational model, more dynamic and interactive.

Therefore, our aim is to create an educational environment using different ways of communication to transmit knowledge about health topics and prevention, allowing interactivity and motivating the audience. This experience must go beyond the structured educational environment, allowing it to be replicated in a fast and effective way, besides stimulate the continuous learning.

## METHODS

Developing of the following topics in two different environments: voice, hearing, vision, skin, locomotion and spine (environment 01); knowing your body, tobacco, alcohol and illegal drugs (environment 02). To broadcast contextualized information using multi platforms in communication in the following steps:

a. Visual communication: development of interactive panels highlighting meaningful points of each topic, correlating images and texts, and attached to questioning messages to encourage Internet research for complimentary knowledge.

b. Dynamic communication: screenplays from scientific information to develop knowledge unit sequences, with voice over and subtitles, based on 3D computer graphics learning objects (Virtual Human Project®). To deliver dynamic information with journalistic approach.

c. Expanded communication: development of an online curiosity database to expanded learning (homenvirtual.org), attached to the complimentary learning points of the panels and videos detached with the message 'Aprenda mais' (learn more).

Adapt the content to be replicated in large scale besides the Interactive Learning Environment. Steps to be developed together with the learning environments:

a. Visual communication: format the panels content to fit in posters with A3 paper size, and for a horizontally oriented A4 size as a double page.

b. Dynamic communication: to edit the audio-visual content to DVD format with resolution 720 x 480 pixels, navigation menu, and related graphics.

## RESULTS

We've developed an integrated set to teach health issues with the aim to create an educational environment in health using different communication tools to deliver knowledge. The set was deployed at the Catavento Cultural e Educational museum, in the city of São Paulo.

Fig.1 - Environment 01 at the Catavento museum with panels and human body mock-up.


The environments are made of panels with interactive messages and complementary information videos with 3D computer graphics of the human body. These sequences have screenplays and subtitles following the narration to stimulate the knowledge acquisition through 3 ways: vision, hearing, and cognition (message interpretation). Moreover, the environments brings specific contents developed for the website and detached with the message "Aprenda mais" (learn more) printed in the panels and at the end of the videos. The users can access audio-tips, orientation videos and more sequences related to the topic at the virtual environment. A multidisciplinary team worked in the project development. That included health professionals, journalists, audio-visual team, digital designers, and IT team of the Discipline of Telemedicine of USP School of Medicine – FM USP. Then, every content was validated by specialists in each field from the School of Medicine and Clinical Hospital complexes.

The Educational Communication Design team was responsible for the panels' development, videos production, and website contents. Always adapting the scientific language to the target audience of the Catavento Cultural and Educational museum: children and teenagers. The information is shown in a simple and straight way, using video-editing techniques, journalistic approach, and writing techniques for panels, videos and website. Thus, all museum visitors may understand how the body structures are affected, absorb this knowledge, and being motivated to seek for more knowledge through the Internet.

The Environment 01 is made of 6 panels with information, illustrations, and diagrams about voice, hearing, vision, skin, locomotion and spine. Each panel has a 42 inches LCD TV continually broadcasting a 3D animated sequence of the human body (Virtual Human Project®) about the specific topic. These sequences have narration, subtitles and additional information. A smaller reserved room was also developed with another 42 inches LCD TV with additional topics about the human body. In this specific room you have to wear earphones to listen and there's no related panels.

At the Environment 02 the topics knowing your body, tobacco, alcohol and illegal drugs are presented in six panels and four 42 inches LCD TVs each – now as part of the panels' layout – in a room with about 75 square meters. Each panel address a specific matter. The videos have complementary information to the panels and the website add more information on each topic. This space brings images from the Drug Enforcement Administration – DEA, the American department fighting against drugs. High resolution images of different kinds of drugs are shown together with before/after images of drug addicted men and women. Museum tutors also promote activities developed by the multidisciplinary team of the Discipline of Telemedicine with scheduled groups.

Fig.2 - Tobacco panel with Virtual Human Project® sequences.

After the Interactive Learning Environment production, all developed content was formatted to be replicated in large scale. The 10 Virtual Human Project® sequences were putted on a DVD with 720 x 480 pixels resolution, and accessible through an interactive menu. The DVD also featured subtitles options in English and Spanish, besides the native Portuguese subtitles.

The panels were edited to fit in a paper size A3, folded up in 4 parts to the equivalent size of the DVD box. The same panels were once again edited to a horizontal orientation to fit a paper size A4 as a double page. This material was edited as a brochure and released together with the DVD box and the posters (panels in A3 format). The set ended up as an educational kit named Youth Series 1 – A science museum per school. The kits were sent with no charge for every public and private school that shown interest in the State of São Paulo. The only demand was the deployment of the Interactive Learning Environment in up to 90 days with at least one open day to the community. Afterwards, the Youth Series 2 was also released with more 10 topics in health.

Therefore, we used multimedia resources with the aim to retain knowledge about health by correlating panels (visual communication), audio-visual screenplays with 3D computer graphics, voice-over and subtitles (dynamic communication), together with the Internet to develop a proposal of exposition of meaningful contents in health issues. Moreover, all the developed content was adapted to be replicated in an effective and fast way. The Virtual Human Project sequences also keeps been broadcast in the project's website and at the educational virtual channels of the Discipline of Telemedicine.

## DISCUSSION

The inter-related ideas exposed in the panels, videos and website allows the student to establish a link between the scientific content and their personal experiences. It's a set of information and communication medias complementary to each other. The 3D images awake the students' interest for the topic, e.g., once it shows the human body systems functioning. Synchronized images, narration and subtitles show exactly how the body reacts to external impulses. A subject previously hard to be understood reading a complex scientific text, now turns into something pleasurable to watch and hear, stimulating the knowledge retaining.

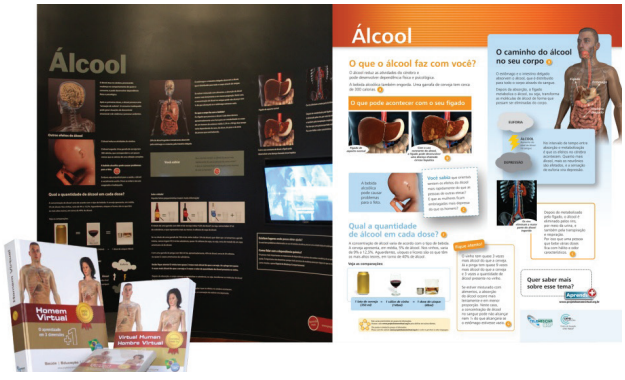
To encourage the seek for more information over the topic, the messages 'Aprenda mais' (learn more) are placed in the panels and at the end of the videos as an integrated and complementary part of the learning process. These messages are strategically inserted in specific sentences to mean that the subject isn't finished and there's more to be learned.

This kind of information architecture was created to encourage the use of the Internet, another communication media that may be a great allied in the knowledge dissemination. The Virtual Human Project® website is the source for complementary information of what had been seen in the Interactive Learning Environment. It's the first step for deeper research of scientific contents. But not as a teacher's demand in this case, once it becomes more organic and spontaneous.

The challenge then became to turn the physical structure in an Interactive Learning Environment that could be deployed in libraries, classrooms or even as part of Knowledge Stations.

An important contribution of this model is the possibility of use not only in scientific museums. The set of kits with the 3D audio-visual sequences together with the posters may be used by to build digital environments in health in any school and with few technological resources. The replication feature of the Interactive Learning Environments is a practical way to socialize the knowledge in health. Every school in Brazil – even those in need – may have access to this scientific knowledge. All they need is a television connected to a DVD player, a computer with Internet access and one Interactive Learning Environment kit. The two Youth Series set have 20 individual posters and two DVDs with the 3D sequences from the Virtual Human Project with narration and subtitles.

Fig.3 – Alcohol panel with the adapted poster and the Youth Series kit



Therefore, it's important to see how info-education concepts apply to different kind of learning processes and in different educational models. In this case, adapting the contents to each cultural archetype.

The cultural archetypes allow the actors of certain culture to interact with the learning environment. Thus, to add emotional aspects to the communication may be cognitively more meaningful for who will access it. This improves understanding and retaining of what is shown. That's why it's so important to adapt contents according to social and cultural contexts.

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