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ORIGINAL

Epilepsy Web, a tool for learning content related to epilepsy in pediatrics

Epilepsy Web, una herramienta para el aprendizaje de los contenidos relacionados con epilepsia en pediatría

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ABSTRACT

Introduction: epilepsy is a recurrent neurological disease that is part of the curriculum of Medical Sciences students in Pediatrics. It appears as a complex module even for professionals.
Objective: to create a website on epilepsy in Pediatrics as a reference tool that compiles in a didactic way contents according to the syllabus of the Medicine course.
Method: a development study was carried out at the University of Medical Sciences of Granma, from February 2023 to July 2023. For the evaluation of the elaborated web page, users' criteria were taken into account through a survey. The data were processed in a computerized way using descriptive statistics.
Results: the acceptance of the product by users and computer experts was high, rating it 98.9 %, 100 % and 90 % as very adequate.
Conclusions: a web site on epilepsy in Pediatrics was created, which from the didactic requirements constitutes a useful tool for the medical student.

Keywords: Learning Object; Web Site; Medical Education; Epilepsy; Neurology; Pediatrics.

RESUMEN

Introducción: la epilepsia es una enfermedad neurológica recurrente que forma parte del programa de estudios de los estudiantes de Ciencias Médicas en Pediatría. Figura como un módulo complejo incluso para los profesionales.
Objetivo: confeccionar un sitio web sobre epilepsia en Pediatría como herramienta de consulta que recopile de forma didáctica contenidos según el programa de estudio de la carrera de Medicina.
Método: se realizó un estudio de desarrollo en la Universidad de Ciencias Médicas de Granma, de febrero de 2023 a julio de 2023. Para la valoración de la página web elaborada se tuvo en cuenta criterio de los usuarios a través de una encuesta. Se procesaron los datos de manera computarizada utilizando la estadística descriptiva.
Resultados: la aceptación del producto por los usuarios y los expertos en informática fue elevada, calificándolo el 98,9 %, el 100 % y el 90 % como muy adecuado.
Conclusiones: se confeccionó un sitio web sobre epilepsia en Pediatría, que desde los requerimientos didácticos constituye material de consulta y una herramienta útil para el estudiante de Medicina.

Palabras clave: Objeto de Aprendizaje; Sitio Web; Educación Médica; Epilepsia; Neurología; Pediatría.

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INTRODUCTION

The vertiginous development of science and technology in recent years has reached all spheres of scientific knowledge. Medicine nourishes its fundamental and related branches daily, allowing better integral attention to the population and a higher quality of services. Thus, Informatics, Cybernetics, Automatics, Social Sciences, and Educational Sciences, among others, play a fundamental role in the development of Medicine in the 21st century. With the introduction of new equipment, techniques, systems, and medical assistance, public health has reached its development. The fundamental premise of innovation has played a fundamental role in students' scientific research, contributing to the vertiginous development of Cuban Social Medicine.[1]

According to the Style Standards for the Presentation of Scientific Research (EPIC), a finished product results from technological development and innovation projects and research; it can be a new or improved product that facilitates human life. Technological or applied development products are those projects and research that must reach an advanced stage of the complete cycle with the same characteristics that define a finished product. A web page, however, is an interactive electronic document with images, videos and other files adapted for the World Wide Web (www), which is usually part of a website. Its main characteristic is the page hyperlinks. It is composed primarily of information (text only or multimedia modules), as well as hyperlinks; it may contain or associate style data to specify how it should be displayed and embedded applications to make it interactive.[1]

Epilepsy is a clinically diagnosed chronic disease characterized by recurrent seizures, which have varied manifestations and causes and respond to sudden and hypersynchronous discharges of the cerebral cortex.[2] It is part of the curriculum for students of Medical Sciences. The authors consider it to be a complex module, even for professionals.

Based on this problem, the authors pose the following scientific problem: How to elaborate a technological product that contributes to the students' deepening in the contents related to epilepsy according to the Pediatrics Program, due to the difficulty of the epilepsy contents in the Pediatrics rotation, at the "Hermanos Cordové" Pediatric Hospital, in Manzanillo, Granma?

In the search carried out by the authors, website-type product was not found in the country or the world reported in the literature with these characteristics. What has been done needs to be revised.

The hypothesis is that if a website on epilepsy in Pediatrics is developed for students of Medical Sciences, a qualitative and quantitative superiority of their knowledge will be achieved, reflected in the results achieved in seminars and other evaluations, preparing them for medical practice.

The authors consider that its realization is justified by its convenience and practical usefulness for both students and teaching staff due to the complexity of the content, besides constituting a reference material and a useful tool for understanding the subject matter.

The objective is to create a learning object on epilepsy in paediatrics as a reference tool that compiles contents according to the syllabus for medical students in a didactic way.

METHOD

Design of the finished product

The product was developed at the Faculty of Medical Sciences of Manzanillo between January and March 2023 through the joint work of medical students, a paediatrician, a neurologist and a computer scientist, being these the authors, tutors and authors of the research, each one performing tasks related to their scientific, academic and professional level. The website was created simply using HTML and CSS language (Boostrap). It was created using Visual Studio Code, a free application that does not require a license. It was designed in liquid form (which can be visualized on PC screens or phones).

The exercises were made in Hot Potatoes (an authoring tool) to do exercises for self-evaluation, as well as in HTML and Javascript. The videos are in small web format (webm) and can be viewed from any browser. It contains audio podcasts made by the authors of the product.

The product is made using a single page. It is better known as SPA design, which shows the content in different sections to facilitate the user's navigation and faster loading of the content in the browser. The SPA-based design is a basic structure that includes a header, a body and a footer. The content is divided into sections that describe services, treatments, reservations, location, etc. In addition, a CSS style file is included to customize the website's appearance.

About the testing

A technological development or applied study was conducted with four-year brigades of the Medicine career that rotated in the first semester of the year 2023, from February to August, at the Hermanos Cordové Provincial Pediatric Hospital in Manzanillo, Granma, Cuba, for a total of 98 students. The universe coincided with the sample. For the evaluation of the web page elaborated, users' criteria were taken into account through a survey. The experts' criterion was also used, consulting five professionals from the Department of Informatics of the Faculty of Medical Sciences of Manzanillo and ten paediatricians (including a pediatric neurologist) in the teaching category of the Hermanos Cordové Pediatric Teaching Hospital in Manzanillo, Granma.

The following variables were studied: aesthetics of the user interface, affordability of the contents provided, general acceptance of the product, the actuality of the contents, correspondence between contents and objectives of the subject and scientific level of the contents, all of them being ordinal qualitative variables operationalized as very adequate, adequate, not very adequate or inadequate.

The data were processed computerized through the IBM SPSS Statistics processor.

The principles of the Declaration of Helsinki were considered for this research, and it was approved by the Ethics Committee of the Faculty of Medical Sciences of Manzanillo and the Hermanos Cordové Provincial Pediatric Hospital.

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RESULTS

Figures 1 through 5 show the different views and interactive sections of the web site.

It contains the following sections:

- General Terms
- Clinical Features
- Complementary Tests
- Comprehensive Management
- Self-assessment
- Gallery

Its contents respond to the elements of the Pediatrics program of the Cuban Medical School. It includes:

Epilepsy, Concept, physiopathology, epidemiology, clinical characteristics, classification of seizures, classification of epilepsy, complementary examinations, positive and differential diagnosis, prognostic evolution, complications, integral management of the epileptic child in PHC.

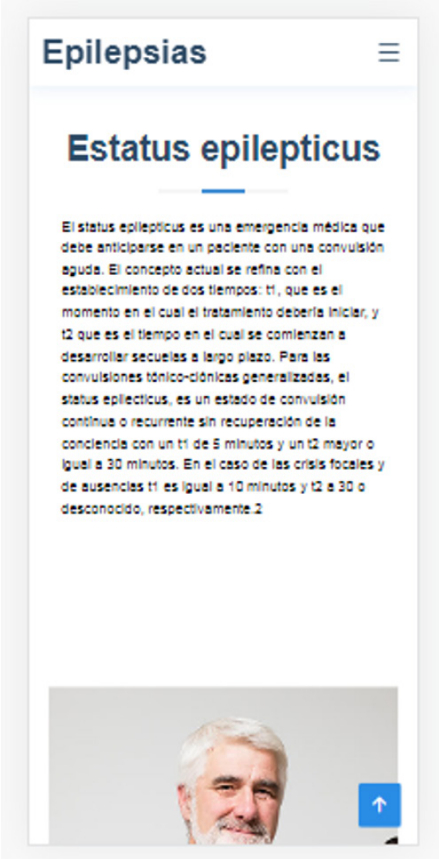

Figure 1. Mobile view

Figure 2. Computer view

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Acute convulsive syndrome: Concept, pathophysiology, aetiology, epidemiology, clinical manifestations, complementary examinations, syndromic, positive and differential diagnosis, precipitating factors, evolution, prognosis, complications, emergency treatment, febrile seizure criteria, Concept of status epilepticus.

Figure 3. Self-Assessment Exercises

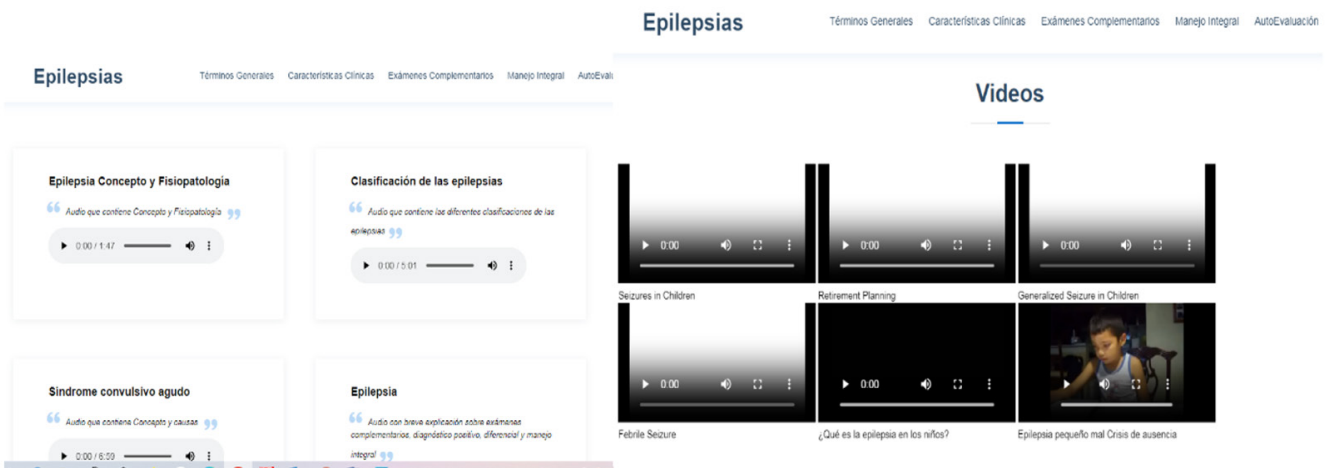

Figure 4. Multimedia view with videos and podcasts

About product testing

Table 1. Experts' criteria regarding the computer performance of the web site (computer scientists n: 5)

Variable	Scale	n	FR%
Aesthetics of the user interface	Very adequate	4	80
	Adequate	1	20
	Poorly adequate	-	-
	Inadequate	-	-
Affordability of the content provided	Very adequate	5	100
	Adequate	-	-
	Poorly adequate	-	-
	Inadequate	-	-
General product acceptance	Very adequate	5	100
	Adequate	-	.
	Poorly adequate	-	-
	Inadequate	-	-

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Table 1 shows that 100 % of the experts rated the overall product as very adequate.

Table 2. Experts' criteria regarding the pedagogical component of the website (pediatricians n: 10)

Variable	Scale	n	FR%
Actuality of the contents	Very adequate	10	100
	Adequate	-	-
	Poorly adequate	-	-
	Inadequate	-	-
Correspondence between contents and objectives of the subject.	Very adequate	8	80
	Adequate	2	20
	Poorly adequate	-	-
	Inadequate	-	-
Scientific level of the contents	Very adequate	10	100
	Adequate	-	-
	Poorly adequate	-	-
	Inadequate	-	-
General acceptance of the product	Very adequate	9	90
	Adequate	1	10
	Poorly adequate	-	-
	Inadequate	-	-

Table 2 shows that 90 % of the pediatric experts rated the product as very adequate.

Table 3. Users' opinion of the website (students n: 98)

Variable	Scale	n	FR%
Aesthetics of the user interface	Very adequate	90	91,8
	Adequate	7	7,1
	Poorly adequate	1	1,1
	Inadequate	-	-
Affordability of the content provided	Very adequate	98	100
	Adequate	-	-
	Poorly adequate	-	-
	Inadequate	-	-
Up-to-dateness of the contents	Very adequate	100	100
	Adequate	-	-
	Poorly adequate	-	-
	Inadequate	-	-
Correspondence between content and subject objectives	Very adequate	97	98,9
	Adequate	1	1,1
	Poorly adequate	-	-
	Inadequate	-	-
Scientific level of the contents	Very adequate	98	100
	Adequate	-	-
	Poorly adequate	-	-
	Inadequate	-	-
General product acceptance	Very adequate	97	98,9
	Adequate	1	1,1
	Poorly adequate	-	-
	Inadequate	-	-

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Table 3 shows that 98 % % of the users rated the website as very adequate.

DISCUSSION

Technological advantages of the website

Liquid HTML website design refers to a web design technique that allows the content of a web page to automatically adjust to the screen size of the device on which it is being viewed. This means that the design adapts to different screen resolutions, making the page look good on any device, whether a desktop computer, tablet or cell phone.

In a liquid layout, page elements such as text, images and content blocks adjust dynamically as the browser window or device screen size changes. This is achieved by using relative units of measurement, such as percentages, rather than fixed measurements, such as pixels. In addition, in a liquid design, techniques such as using flexible columns and grid layout are often used to create a scalable design. This allows page content to accommodate screen sizes without sacrificing readability or usability.

Teaching Utility

Higher Education in Medical Sciences has grown in producing educational software-type teaching aids. Nowadays, the educational system is not centred on the teacher's thinking; this constitutes an intermediary between the student and the knowledge, where the educational software has a fundamental role as a tool and means of communication between them.[3]

There are numerous studies of technological innovation, such as those of Echavarría Torres et al., Hernández Jaime et al., and Cabrera Hernández et al., where the result introduced improves the teaching-learning process.[4,5,6] The authors agree when it is stated that universities should bet on greater teacher training processes to develop trainers' digital skills, which are the main responsibility for developing the curriculum so that students experience the benefits of ICT. The literature consulted shows results that agree with those obtained in the present study regarding the acceptance of educational software by teachers or personnel in charge of using it. The teachers included in this study gave favourable consideration to the website. Given the need for complementary literature, they thought it was a useful tool. They recommended making it available to other institutions in the country, which would serve to improve its future evaluation. The students improved the performance of the evaluated topics, which was verified by the teachers in the service of Miscellaneous or Pediatric Clinic from the visits and seminars, ratified with the subject's final exam. With the applications of these computer tools for educational purposes, the student can study at his own pace since the information is arranged so that it is easy to understand. This type of element allows for breaking down barriers of distance, time, and use of resources. It shortens the gaps in access to timely attention, all of which benefit the continuous development of the educational teaching process without being interrupted by epidemiological or natural events. On the other hand, new information and communication technologies are well accepted among young people; through them, it is possible to educate with advanced scientific, cultural and social development. The website constitutes a contribution since this type of product has been determined to influence and strengthen the learning of university students, as stated by Zenteno, Carhuachín and Rivera[7], who conducted research that analyzes the use of the educational software Micromundos Pro for teaching and learning the subject of mathematics in the Pasco region and at the basic education level, determining, after a stage of experimentation and statistical analysis through a pretest and posttest. On the other hand, it was determined that the pedagogical dimension of the educational software influences the learning of university students, which agrees with Silva and Montañez, who approached a study that analyzes the process of incorporation of the multimedia educational software Ludos to the area of Recreation, Physical Education and Sports, to provide a solution to the lack of use of communication technologies in the school sports area. In this way, it was found that important indicators of the pedagogical aspect, such as the fulfilment of objectives, the way of presenting information, and interaction, among others, influence university students' learning.[(8)]

Finally, the acceptance of the technological dimension of educational software, which influences the learning of university students, was proven, according to the study elaborated by Tamayo and Milanés, who carried out research that described the teaching experiences obtained from a validation of the educational software Educative Software for Training in Risks and Integrated Coastal Zone Management (EMIZoC), which was designed to be an interactive simulation tool for the teaching and learning of undergraduate and graduate students in topics related to risks and integrated coastal zone management, determining that the incorporation of this educational software strengthens the development of professional and communicative skills in current and future urban planners. Thus proving that key aspects of the technological dimension, such as problem-solving, appropriation and use of technology, among others, are of importance for the student's learning process.[9] Taking into account the results of this study, the authors of this research suggest the need for universities to contribute with more effort in the creation of this type of products, which allow to deepen and develop technologies capable of shaping in a new way the study techniques of students, experiencing the benefits of ICTs.

In conclusion, a website on epilepsy in Pediatrics was created, which, from the didactic requirements, constitutes consultation material and a useful tool for the medical student. Most experts and users highly accept the product and qualify it as very adequate.

FINANCING

No funding sources were received

CONFLICT OF INTEREST

No conflicts of interest declared

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