Multimedia, herramienta de apoyo al modelo de aprendizaje autogestivo

Multimedia; supporting tool to the selfmanaged learning model

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Resumen

El presente trabajo describe el diseño y desarrollo de un software multimedia llamado "Softaweb" que se implementó en el Centro Universitario de los Valles para apoyar a los estudiantes de la licenciatura en Educación en la materia de "Uso de Tecnologías en la Educación IV". Se diseñaron lecturas simples acompañadas de pantallas capturadas en formato RTF (Rich Text File – Archivos de Texto Enriquecido), así como animaciones, videos y ejercicios prácticos que se integraron en un solo programa de escritorio.

La aplicación multimedia apoyó a los estudiantes para que de manera independiente y autogestiva aprendieran a utilizar de manera básica un paquete de diseño de páginas web conocido como Macromedia Dreamweaver. En una primera etapa se identificó la necesidad de apoyar a los estudiantes del cuarto semestre de educación pues se les pide desarrollen un sitio web educativo y en sus materias no ven aspectos de diseño de páginas web. En una segunda etapa se diseñaron y desarrollaron los elementos multimedia como videos, animaciones y lecturas que conformaron el paquete multimedia de autocapacitación.

En una tercera etapa, se implementó la herramienta a una muestra de 10 estudiantes que contaban con equipo de cómputo en sus casas. En una cuarta etapa se evaluó la herramienta por parte de los estudiantes así como por un experto en el área de pedagogía y otro en el área de tecnologías de la información. Por último se recabaron las observaciones tanto por los expertos como por los estudiantes y se implementaron

en la herramienta para así tener un software multimedia más completo y adecuado tanto a las necesidades de los usuarios como a las exigencias del aprendizaje autogestivo.

Abstract

This paper describes the design and development of multimedia software called "Softaweb" that was implemented in the University Center of the Valleys to support undergraduate students in Education in the field of "Using Technology in Education IV".

Simple readings were designed accompanied by screen captures in RTF (Rich Text File - Rich Text Files) as well as animations, videos and practical exercises that were integrated into a single desktop program. The multimedia application supported students to independently and self-managed so learn how to use basic design package web pages known as Macromedia Dreamweaver. The first stage identified the need to support students in the fourth semester of education as they are expected to develop an educational website and its materials are not aspects of web design. The second stage is designed and developed multimedia elements such as videos, animations and lectures that formed the multimedia package of self-empowerment. In a third step, we implemented the tool to a sample of 10 students who had computer equipment in their homes. In a fourth step the tool was evaluated by students as well as an expert in the area of education and another in the area of information technology. Finally observations were collected by both experts and the students and implemented in the tool in order to have full multimedia software and well suited to the needs of users and the demands of self-managed learning.

INTRODUCTION

The Valles University Center has an academic model that is different from that of the other University Centers of the same University of Guadalajara. The CUValles academic model is focused on learning and the student, where through the support and use of technologies, the student himself is the one who determines his pace of study; In addition, they only attend face-to-face classes twice a week and complete their study and academic work through learning platforms such as WebCT and Moodle, which allow them to carry out discussion activities, send homework and work through the Internet, synchronous and asynchronous teacher-student interactivity, online assessments, etc.

The University Center of the Valleys (CUValles) is part of the University Network of the University of Guadalajara, it is one of the Regional Centers located in the interior of the state of Jalisco and is located at Carretera Guadalajara – Ameca Km. 45.5 in the municipality from Ameca, Jalisco.

Navarro (2007) in his sixth report of activities disclosed how this University Center is structured both in the administrative and academic part CUValles is made up of a Center Rector from which the Administrative Secretary and the Academic Secretary emerge, it also has a Division of Scientific and Technological Studies from which the Departments of Computational Sciences and Engineering and the Department of Natural Sciences are derived; there is another Division of Economic and Social Studies which is in charge of the Departments of Economic-Administrative Sciences and the Department of Social Sciences and Humanities. The four Departments are headed by a Department Head and also have a departmental college and academies.

In February 2007, 1,967 students were registered, distributed in the different degrees offered at this Center, of which 55% are women and 45% are men. The student population is relatively young, 81% is between 17 and 22 years old and only 2% between 41 and 59 years old. The students come from 36 municipalities in the state of Jalisco, of which Ameca stands out with 35.7%, Tala 13.6%, San Martín de Hidalgo 11.0% and Ahualulco de Mercado 9%. It should be noted that 4.4% come from the Guadalajara Metropolitan Area, a percentage that has been increasing. At the end of

the 2006B school calendar (December 2006) CUValles already had 653 graduates, of which 70% have already graduated.

As for the teaching staff, there are 128 teachers, of which 57 are full-time and 71 for subjects; a staff is maintained in which almost 45% of the teachers are full-time. The 57 full-time professors have postgraduate degrees, four of them have a doctorate and 15 are studying it. Only 46% of subject teachers have a bachelor's degree, the rest have a master's degree or are interns for a master's degree.

As far as physical infrastructure is concerned, CUValles has 54 learning laboratories or academic classrooms, 1 Academic Services Center, 8 Computer Laboratories and the Alternative Tourism laboratories, the Legal Practice and Consultancy Laboratory, the Center for Organizational Consulting and Assistance (CECAO) and Specialized Software Development. It offers student services such as Scholarships and Exchanges, Language Learning as well as Medical and Psychological Services.

Due to the fact that CUValles bases its academic model on Technologies for Learning and centered on learning, its students require computer equipment in the communities where they live and for this reason technological spaces have been implemented in several municipalities of the Valles region called CASA (Center for Self-Access to Academic Services) which have videoconferencing equipment, television, DVD and Internet access. The municipalities that have this service are: Ameca, Ahualulco, Etzatlán, San Martín Hidalgo, Tala and Talpa de Allende.

The administrative staff of CUValles is made up of 44 directors, 7 trusted and 50 unionized.

Within the bachelor's degrees offered by the Los Valles University Center, there are those of: Administration, Accounting, Law, Computer Science, Tourism Education and Agribusiness and of which it can be mentioned that two to three of these bachelor's degrees require an additional effort for its technical nature, mainly the degree in Computer Science. The CUValles academic model has allowed young people from the Valles region and its surroundings to finish their professional training using an

unconventional scheme, but at the same time new needs and problems are beginning to be discovered in the degrees that require even more time in terms of internships or learning workshops are concerned. That is why students of the Computer Science degree and the Education degree have suggested having tools or extra support materials that effectively help their professional training, mainly in the technical part such as the use of some specialized software. The virtual or online scheme has significantly supported the teaching of subjects that are theoretical, however the workshops still require the presence of students in the classrooms, **which could be solved or resolved by producing multimedia materials** that explain step by step in a visual and auditory way the use or manipulation of some software tool, some programming language, configuration of network equipment, development of web pages, etc.

Within the teaching of several subjects in different careers of the University Center of the Valleys, teachers ask their students to develop projects related to the development of pages or even complete websites as well as their publication on a free hosting server.

The students who have to present this type of work are those who in their first semester of professional training take the subject called "Basic Computer Science" in which at the end of the study program they must develop at least 5 interlinked web pages, with resources such as animated gifs, text, static images and others, but the most complicated part occurs when students need to publish their work on the free server because they do not know the methodology to follow when transferring files from their personal computer to the server web as well as they do not know how to manage their own website once it is published. In addition to first-semester students who need to know how to create websites or web pages, students studying the Bachelor of Education in their course "Technologies in Education IV" are asked to create a website with characteristics similar to those that students of the subject of "Basic Computers" are requested. I am referring to designing several interlinked web

pages, with resources such as moving images, static images, texts, headers, etc. As well as publishing your work on a free web server that we can find on the Internet.

All these antecedents, make the undersigned think that having an off-line manual type tool or program (multimedia electronic manual) that supports students in terms of training the use and management of some specialized software for the development of web pages , the administration of its files and the publication of the same, would encourage the students of the different careers that require carrying out this type of tasks or jobs, to carry them out without fear and **self-taught way** Well, in the comfort of your home, on your personal computer and without the need to take any course in person, you can learn through multimedia integration software made up of resources such as videos, texts and sounds that in a graphic and attractive way , motivate the student to learn with or without a teacher.

The multimedia support software that was developed was of the off-line type, since it was not necessary to have an Internet connection in order to have access to the instructions and lessons of the basic web page development course. This is due to the fact that today many students already have a computer at home, but many of them still do not have an Internet connection, which makes it difficult to access online courses on platforms such as WebCT or Moodle.

OBJECTIVES

1. Develop multimedia software aimed at students of the Bachelor of Education at the Centro Universitario de los Valles who are studying the subject "Use of Technologies in Education IV" that allows them to learn in a self-managed way to develop their own web pages, as well as as well as students of any CUValles degree who wish to use it.

2. Promote self-management study techniques in the students of the CUValles Bachelor of Education through the use of multimedia.

3. Make use of different media such as text, image, animation and sound in the teaching-learning process so that the students of the Centro Universitario de los Valles learn in a self-taught and meaningful way the development of static web pages. .

4. Generate in CUValles students the motivation for self-learning and for the use of technological didactic tools that help them acquire technical and methodological skills in the field of developing websites or online learning environments.

5. Support the students of the Bachelor of Education of the Centro Universitario de los Valles in the construction and publication of their final project of the subject "Use of Technologies in Education IV" so that they themselves are trained in the development of the site educational website that they are asked as a final product which they have to publish on the Internet to pass said subject and that they achieve this with the help of a multimedia software-type tool.

THEORETICAL REFERENCES

Multimedia: communication that generates learning

One of the most exciting and changing areas of education in the world today is the development of computer-based materials, especially packages that are interactive. These technologies offer students and teachers the use of support materials that were not previously available in the educational field. Multimedia can present large amounts of information in different formats such as illustrations, photos, video, audio, animation and text. The integration of all these media changes the way of transmitting information that can be adapted for learning. Interactive multimedia can be an effective and powerful tool in education and can be incorporated into the teaching-learning process. (Bass, 1997 p. 1)

But… and what is interactive multimedia?

Interactive Multimedia, according to Bass (1997 p. 3) has been called a "combined technology" that mixes the storage capabilities of large databases with the advantages of information visualization and manipulation tools.

Multimedia has several meanings depending on the context of which can be mentioned:

Interactive Multimedia: It is a package of materials that includes the combination of texts, graphics, small images, animations, videos and sounds; These materials are packaged, integrated and linked through different means and have the ability to be personalized by the user.

Multimedia technology is a good tool that allows students to explore real life examples and concepts that are applied on a daily basis. This technique of using multimedia in education allows students to become more active and involved learners which motivates them to learn even more. (Powers, 2003)

Beecham, Elliott, Alty, and Al-Sarrah (2002) concluded from their study that comprehension of information was improved when it was presented using a multimedia product that included sounds, diagrams, and text. Additionally, the sound and diagram combinations improved and increased the student's study and learning preferences.

Ivers and Barron (1998) mentioned that products that are made up of multimedia resources promote learning in different ways.

They suggest that an advantage of multimedia applications is the way of presenting the same information or the same lesson in different ways, which allows students to learn in their own learning style since they enable constructivist learning environments in which the student builds their own learning. They are the students who find the contents of multimedia products interesting, significant and applicable to their daily lives.

On the other hand, interactive multimedia can be a powerful educational tool because it engages many of our senses in the learning process. Students who use multimedia

are reading, viewing, listening and manipulating different materials in the same learning environment.

As human beings, it seems that we learn with the combination of all our senses, let us remember that we only learn 10% of what we read, 20% of what we listen to, 30% of what we see while listening, 50% when we see someone to do something while explaining it but we learn 90% if we do the work ourselves or practice on our own. In other words, properly developed and implemented interactive multimedia can revolutionize the teaching-learning process (Menn, 1993)

Marqués (2003) stated that multimedia resources have a high teaching power due to their audiovisual characteristics and that this is attractive for students, in addition to the fact that they can be configured or adapted according to the needs and interests of each student.

The use of the different resources that are part of multimedia applied to learning has been a subject of study since the 1960s when David Dale presented the relationship that exists between the use of audiovisual materials and the level of learning by students through of a graph in the form of a pyramid and in which it is distinguished which materials are the ones that most significantly support learning.
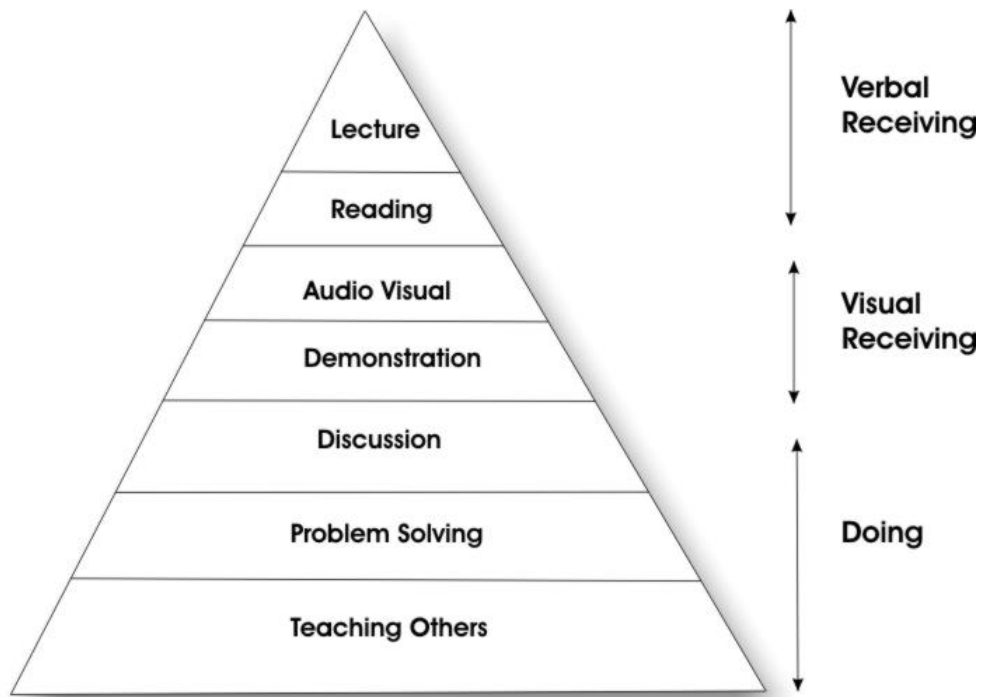
Fig. 1. Learning-Resource Relationship, David Dale (1960)

As can be seen in Figure No. 1, David Dale (1960) summarizes learning with the support of multimedia resources in three main areas: Verbal Learning, which includes textual or informative resources such as readings, books, magazines , articles, etc.; Visual Learning, which includes audio-visual resources such as images, videos, and sounds, and lastly, Practical Learning, which is when a student carries out exercises such as problem solving, carrying out a project, or even teaching others that the student already knows.

From this study, other similar investigations emerged, such as that carried out by Van Dam (2003) who in his book entitled: "The e-learning Fieldbook" shows us a pyramid similar to Dale's but in which he gives us more details about the different means that help the retention of information by the students and that also shows us percentage rates to give us a better idea of the level of achievement. These rates according to Van Dam (2003) are the following:

10% of what is read is retained

It refers to the fact that the materials that serve in an informative way such as readings or content in text format only contribute 10% of the topic completo o en general.

Although it is a very low percentage, the textual contents are a basic part of the didactic materials, since it is necessary to inculcate reading and encourage imagination and creativity in students. It is also important to point out that for this 10% retention to be achieved, the readings must be properly structured and designed for incorporation into multimedia products.

30% of what is seen is retained

The visual elements help the textual ones to retain the information up to 30% of the analyzed topic. If the readings are accompanied by resources such as images, photographs, graphs and diagrams, the student will be able to relate what they are reading with what they are observing in the images and in this way promote greater retention than when they only have plain texts. In order for the graphic elements to be of great support, they must be linked to the ideas that are intended to be made known through reading.

50% of what is seen and heard is retained

This section refers to the use of materials that involve the combination of audio and video. These multimedia resources allow the student to be shown in an audiovisual way how to carry out procedures and analyze how certain tasks are carried out that require them to be done step by step. The 50% retention of information is then supported by resources such as animations, videos, graphic presentations accompanied by audio, etc.

70% of what is said or written is retained

In this section, the fact that the student is an active actor in the teaching-learning process is already taken into consideration. If, in addition to having readings accompanied by graphics, videos, and animations, the student carries out tasks that help him understand what he read or what he observed in a video, his retention level will be

up to 70% of the particular topic. The student must work with the information presented to him by conducting discussions with his classmates, writing a synthesis of

the topic in question or preparing conceptual maps that allow him to outline a large amount of information in a single graph.

You retain 90% of what you do

The highest percentage of retention occurs when the student practices or performs performance tasks that allow him to apply the theoretical part analyzed with the different multimedia resources. Tasks such as projects, procedural exercises, product development and problem solving are some examples in which the student can demonstrate the skills or knowledge acquired through the support of multimedia resources.
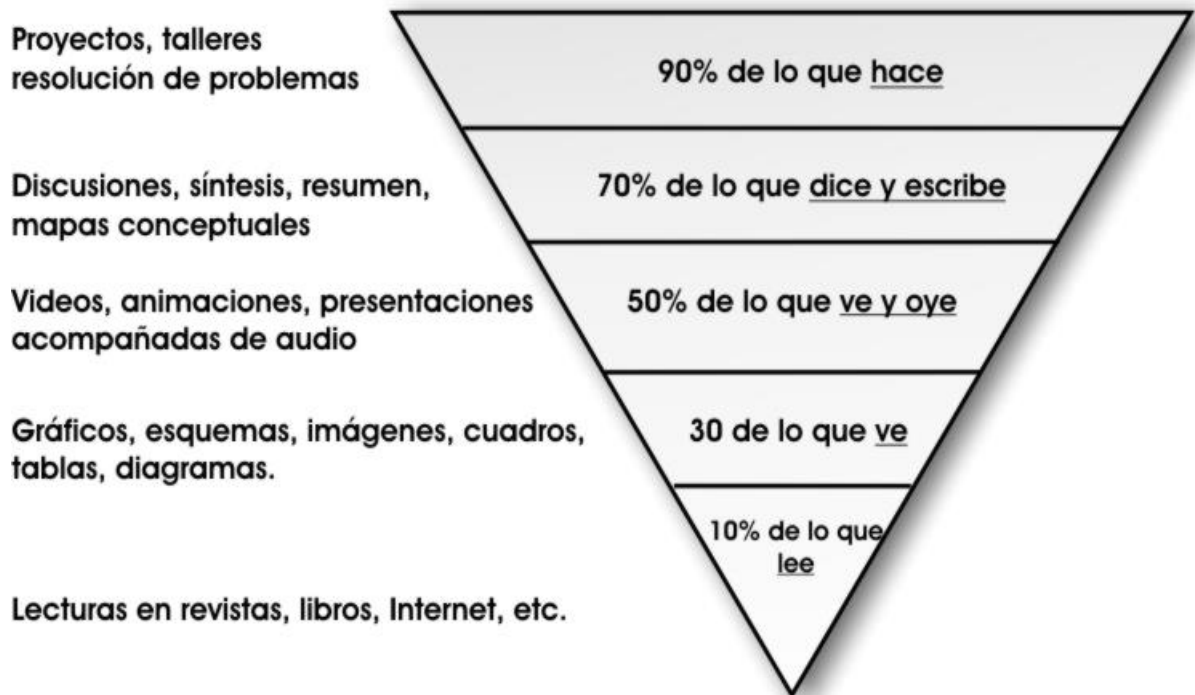

Fig. 2. Information retention rates by resources used, Van Dam (2003)

In this pyramid designed by Van Dam (2003), retention levels can be observed depending on the support resources that are used in the teaching-learning scheme.

Thus, we observe that there is a close relationship between the teaching processes - learning supported by multimedia teaching materials.

Multimedia then can be an important part of the training or education of students whether in conventional or non-conventional modalities.

The use of multimedia technology will contribute to raising the quality of the teaching-learning process by enabling the student to interact with multimedia software to reinforce learning from it. Among the contributions to the teaching of multimedia technology we can count the following:

- o Ease for students to complement their learning
- o It is a self-study solution
- o The teacher can support the teaching process of their face-to-face classes in the classroom
- o Stimulation of the senses in the learning process thanks to multimedia resources
- o Possibility of presenting the same information in different formats

Multimedia is part of what is known as Educational Technology and thanks to it several of the senses of the human being are used for learning and the assimilation of information and the learning objectives are better understood.

Poole (2001) mentions that of the five senses that the human being possesses, vision is considered the most relevant information acquisition device since he says that visual presentations stimulate reasoning and understanding more, although they do not rules out that touch, smell and taste are also important means of learning.

In the learning scheme, students and teachers carry out diverse expressions through words, numbers and images, but these three elements can be presented in different ways, and this is where multimedia makes its appearance, as it encapsulates media such as the video, the animations, the text, the audio and the image and through them the words, the numbers or simply the information that you want to share can be transmitted with a better meaning.

It is Poole himself (2001) who argues that thanks to the use of multimedia and educational technology in teaching, students can learn both individually and in groups, they can take their own learning control themselves and build their knowledge. at their own pace of learning and in the direction of their own needs; this is how multimedia goes beyond a simple computer system because multimedia systems provide a greater learning experience by adding the computer-controlled integration of digital images (still photos or graphic works), movies or videos (sequences or motion graphics), as well as audio (sounds, recordings) that allow teacher-student interaction.

The use of good multimedia resources in education allows for pedagogical advantages over conventional training modalities, regarding these advantages of multimedia programs and educational technology itself, we will mention some of those that Gallego and Alonso (1995, p. 184) state. :

- Improves learning
- Increase retention
- Increases motivation and love of learning
- Reduced learning time
- Pedagogical consistency

Multimedia systems can be used for different purposes or purposes, the same multimedia resource can serve a teacher for one thing and a student for another very different.

The integration of various means of communication and the integration of various perceptual modalities increase the individual's ability to understand and memorize. Hooper's (1986) research showed that people more easily learn and remember knowledge presented visually and also those in which the subject actively participates in its acquisition, instead of adopting a merely passive or receptive role. These results serve as the basis for the interactive learning that takes place with the new electronic and multimedia materials.

An electronic didactic material must have the same pedagogical characteristics as the rest of the teaching materials, but with the advantages of greater information storage capacity, more possibilities of multimedia representation, greater hypertext link between information units and increased potential. interaction between the user and the electronic equipment.

Based on the arguments described in this theoretical reference on the great didactic contribution that the use of multimedia can make in the field of self-management education, the author demonstrated that it is possible to learn to develop web pages in an attractive, easy and fun way through through the use of the tool called "Softaweb" and without the need to have a teacher or technician in person.

METHOD

The multimedia software "SoftaWeb" is made up of 8 learning modules where each module has its own didactic objective and that together the 8 objectives allow to achieve the main instructional goal.

With the "SoftaWeb" resource, it was intended to develop skills in the users in the field of the elaboration of static web pages at a basic level that allow information to be displayed in HTML documents with the most used components in web pages such as text, images. , links and tables. In addition, with the fact of using a multimedia tool, it was intended to generate in the users the motivation of their own self-learning, so that they see that it is possible to learn with or without the help of a teacher, since we still have students in CUValles who believe that it is always necessary to have the teacher in front of the classroom to learn.

The 8 modules of the "SoftaWeb" project are supported with multimedia resources that were of great help in achieving the instructional objective of each module and that, as described in the reference framework of this work, having several media will help the understanding by the student is more meaningful.

Having been structured by modules and the navigation that "SoftaWeb" has allowed the user to consult and work with those modules that were of special interest to the students, it was not necessary to go from module to module if our user already has some knowledge of some of the modules of the multimedia product.

Each module then allowed to achieve a particular objective and had a specific purpose within the development of web pages.

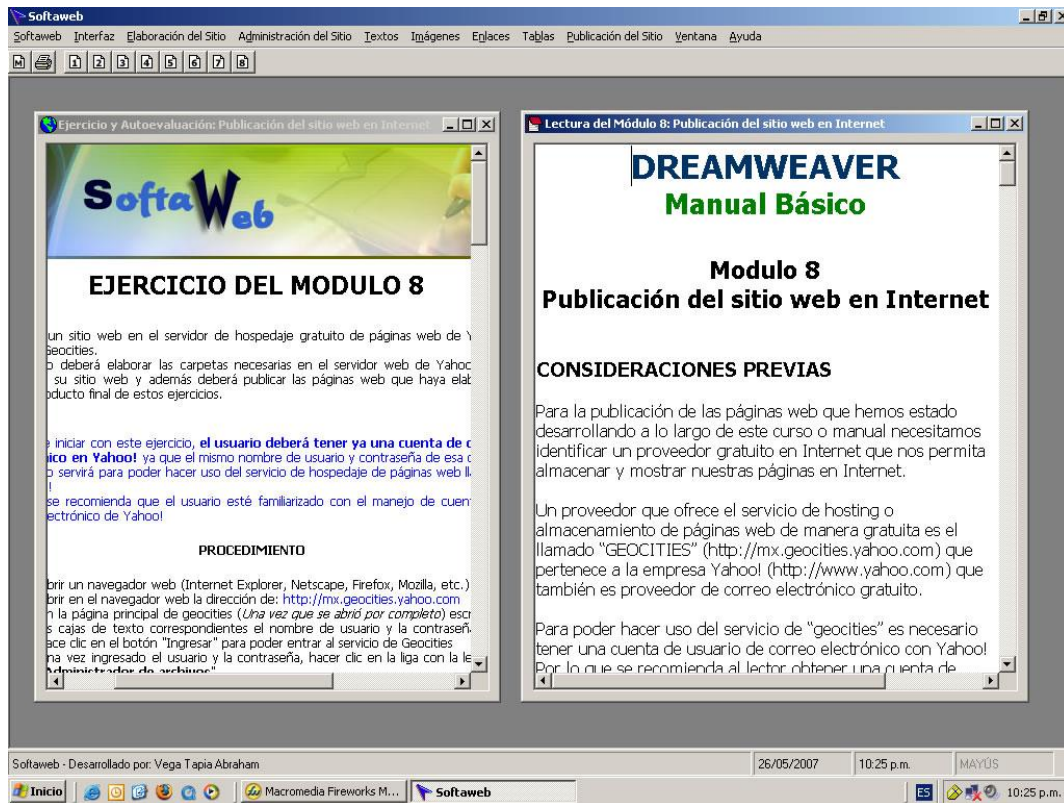Fig. 3. Softaweb multimedia product presentation screen

Fig. 4. Interface of the main window of the Softaweb product. Within this window you can open several documents at the same time such as readings, video, exercise and the guide. They can be aligned vertically, horizontally or cascading.

Fig. 5. Screen for access to all the resources of Softaweb module 8 (the 8 screens of the 8 modules are the same and the learning objective of the module is explained to the user on the screen at the bottom)

Pilot Test Participants

In order to evaluate the impact of this multimedia tool on the students of the Centro Universitario de los Valles, 10 participants from the fourth semester of the Bachelor of Education in the 2007-A calendar were considered. The entire group was made up of 40 students and the sample of 10 users was taken from those who showed interest in learning how to create web pages and who also had computer equipment at home. Within the class schedule of their subject "Use of Technologies in Education IV" they were introduced to the technological product "Softaweb" and it was explained to them that it is a tool that would help them learn to use the program in a basic way. Dreamweaver to make web pages which will help them to develop their final project of the aforementioned matter since they are asked to develop an educational website. When the students saw the interface and the way to learn to make web pages in a self-taught way, they showed interest and willingness to try, use and evaluate the multimedia tool "Softaweb".

Once they tried the multimedia didactic product, the participants helped us to answer the evaluation tool that was designed with Likert scales to find out their opinion, both quantitative and qualitative, regarding the support that the use of "Softaweb" gave them in learning development. of basic static web pages.

Instruments

1. "Softaweb" installation manual. Since the participants installed the multimedia tool called "Softaweb" on their computers at home, it was necessary to prepare an installation manual explaining how to integrate the tool into their personal computer and possible warning messages. or error that could occur depending on the version of the video and animation player that they already had previously installed on their computer equipment. With this small installation manual, the participants were able to install the "Softaweb" multimedia software personally and without technical assistance.

2. "Softaweb" installation CD. Each participant was given a copy of the "Softaweb" installation CD, which is a CD that when inserted into a compact

disc drive of a personal computer automatically starts the installation process which consists of integrating "Softaweb" and your set of multimedia resources (lectures, animations, web pages and educational videos) to the system folders of each participant's computer. The CD starts an installation wizard that takes the user by the hand during the course of incorporating "Softaweb" into the computer equipment and at any time the installation can be canceled if the user so wishes.

3. "Softaweb" evaluation survey. Printed document that consisted of a series of multiple-choice questions designed on Likert scales and that each reagent also had a blank space to know the personal opinion of the reason for the participant's answer in each and every one of the questions. The purpose of this evaluation tool was to know the opinion of the students about the 8 modules that comprise "Softaweb" and their effect on the students' learning in terms of the development of web pages. use of Macromedia Dreamweaver.

RESULTS

Analysis of the results

The analysis was aimed at knowing the particular and personal opinion of each of the participants expressed in the evaluation tool provided to them. Thanks to what they expressed, interesting comments were obtained related to the scope of "Softaweb" as a support for self-managed learning in the production and design of websites.

The purpose of the analysis was to obtain a general outline of the acceptance or non-acceptance of the participants towards a multimedia didactic support tool with a software or application approach and thereby obtain evidence that this type of electronic material can be very useful. to improve or support the academic performance of users.

To process the information from the responses obtained from the items with Likert scales, the Microsoft Excel program was used to create the pie charts that show us the closed opinions or with boxed answers of the participants. For the open or personal

comments in each of the questions, an analysis of the contents was carried out to extract the most interesting and main ideas.

Results obtained

The results show the information obtained related to the application and piloting of the 8 modules that make up the "Softaweb" multimedia tool. Below are the opinions expressed by CUValles education students.

The participants expressed that the topics covered in the "Softaweb" tool caught their attention and that they liked them. Thanks to their participation in the evaluation of "Softaweb" they realized that the development of web pages using Macromedia Dreamweaver is very easy. They thought that thanks to the fact that they start from scratch in the development of websites and that it is divided by modules, the topics covered interested them. 90% of the participants mentioned that the topics are "Very interesting" while only 10% mentioned that they were "Interesting".

On the other hand, 90% of the students who participated in the evaluation expressed that they "Totally agree" that the topics discussed in "Softaweb" will be useful in their academic, work or personal life, since they consider that developing web pages It will be a topic to which they will be very attached because in their career they will need to publish information in web format, either within online courses or on educational websites.

These first two opinions suggest that students learn in a meaningful way those topics that are of interest to them and that are related to their daily life and that thanks to the support of multimedia, the way of learning to develop web pages became pleasant for them; Let us remember what Ivers and Barron (1998) argued related to these issues:

"Multimedia projects promote the active participation of students as they find the content to be interesting, meaningful and applicable to their daily lives"

Additionally, 80% of the students expressed that "Softaweb", based on multimedia resources, is an excellent support tool for the teaching-learning process since it has

different options that allow the user to clarify their own doubts and apply what was learned in the exercises or practices proposed in the same learning environment in software format; They mention that being very descriptive, being divided into modules and starting the topic from scratch makes it an easy-to-use didactic tool and easy to learn the topics that are disclosed in it.

Regarding the central theme of software, which is the development of web pages and whose topic is mainly focused on professionals related to the field of information technology and computing, 90% of the participants told us that thanks to "Softaweb" this topic technical or technological it was made "very easy to understand" because the way of presenting the same information in different formats and in a sequential manner helped them lose their fear of using a professional web development tool such as Macromedia Dreamweaver. The students commented that the support of multimedia resources, mainly animations and videos, foster a self-managed learning environment as they allow seeing even the smallest details of the basic and necessary procedures in the development of a web page.

However, they were asked how they would evaluate their personal learning related to the development of web pages and we found that only 50% of the participants argued that it could be considered "Very good" while only 30% mentioned that it was " Excellent" his self-management learning in the development of web pages. The reasons coincided in that in order to achieve a better learning and mastery of the Macromedia Dreamweaver program, they needed to practice more, perform more exercises apart from the one shown in each "Softaweb" module. The 30% who answered as "Excellent" their personal learning in the field of basic web development told us that it was thanks to the fact that the topics are easy to understand and that the exercises or practices are related to the theoretical aspects of each module.

Lozano (2005) mentions that the didactic materials to support classes must have certain characteristics so that the students' experience is relevant and therefore learning is significant. The students of this century prefer teaching materials that are entertaining, with visual, animated, auditory and interactive content. The contents of the didactic materials must have certain characteristics to achieve the proposed

objectives and among them are that they are motivating materials, that draw the attention of the student and that they are interactive.

Given this mention of Lozano, 90% of the participants told us that the study environment generated by the "Softaweb" interface was "Very attractive", that the way of organizing the materials by modules, the way of presenting the information with graphics, animations and videos and the way in which the different multimedia materials are adjusted to the learning pace of each student allowed to use in an easy way a design and programming program that could be considered as difficult to use for a student of the career of Education.

To reaffirm the theoretical aspects of each Softaweb module and to verify the scope of the learning objectives, the multimedia tool was accompanied by exercises that allowed the participants to practice on their own what they had previously read or visualized with the animation and the educational video. 60% of the students who evaluated "Softaweb" mentioned that the exercises or practices were "Very useful" while the rest said that they were only "useful"; Related to this, 90% of the students commented that the exercises were sufficient to be able to put into practice what was seen in the theoretical didactic materials of each module. With the proposed exercises, the participants considered that they could apply what they learned through reading, animation and video; they mentioned that thanks to these exercises they reaffirmed their new knowledge; who understood and complemented the topics discussed. It is worth mentioning that the exercises that are made up of more steps were the ones that, according to them, should be practiced a little more so that the subject would be even clearer and that, in addition, the wording of the exercises was very explicit and elaborated, which allowed them to be carried out out without any difficulty.

This makes us understand that it is very necessary to give the students the instructions of the activities to be carried out in a very easy to understand way so that there are no doubts and that the intervention of an advisor or teacher is little or none.

One of the main objectives of having developed the multimedia tool "Softaweb" was to generate in users skills in the use and management of the Macromedia Dreamweaver program in a basic way, skills that would be generated in a self-managed way since the student would learn by his own own account aspects related to the production and design of web pages; Given this, the participants were asked if, thanks to the use of "Softaweb", they managed to acquire technical skills in the use of Dreamweaver, to which the highest percentage of students (50%) "Totally agreed" in having achieved learning related to Dreamweaver. basic use of Dreamweaver. 40% "Agreed" and argued that it was because the software is very well developed and that the same step or procedure is shown how to do it with different didactic means, literally one of the participants mentioned: "Why do you learn to do something in different ways, which undoubtedly increases the skill in its use". This suggests that "Softaweb" supported the main goal of helping the participants to learn to use the Macromedia Dreamweaver program and that said learning was acquired by them in a personal, self-taught and self-managed way without the face-to-face intervention of a technician or an advisor, but yes thanks to multimedia support materials.

60% of the students who participated in this evaluation commented that they would be in "Total agreement" in using materials similar to "Softaweb" as support for other subjects within their degree and 30% said that they only "Agree". The students commented that in order for them to perform better in their new role as students within the CUValles academic model, these types of tools that use multimedia to offer students self-managed learning environments would be of great support. They also mention that this type of material has the quality that they do not tire of repeating the same thing in case someone has doubts or needs to be explained again how to carry out a certain procedure and finally they argue that the multimedia materials for both theoretical and practical subjects.

In relation to what was the most significant thing that the participants learned by having used a multimedia didactic tool as support for the teaching scheme - self-

managed learning, they commented that knowledge can indeed be obtained with schemes different from the traditional one, to the scheme where the teacher transmits what he knows to the student in the classroom and where the student is merely passive. The participants commented that thanks to the use of multimedia materials and especially the videos they were able to learn to develop basic web pages with aspects such as images that serve as links, image maps and especially the publication of the pages developed for the Internet; they tell us that they had always considered the subject of publication as something very difficult to do but thanks to "Softaweb" they themselves knew and learned how to publish web documents and even mention it as something very easy to do after having learned it. with the help of "Softaweb".

On the other hand, to find out their opinion about how complete or incomplete "Softaweb" seemed to them in terms of web page development, the participants were asked about what topics or points they would add to it and what topics or points they would take away from this tool. multimedia and let us know that they would have liked to know how to add other objects to the pages in addition to images, such as: background sounds, animations and images of exchange, of those that when positioning the pointer on an image they change for another image. At this point it should be clarified that "Softaweb" from the beginning was thought of as a support tool to develop web pages in a basic way and the topics that are proposed to be added to a second version of this learning tool are considered by specialized bibliographies in the use of Macromedia Dreamweaver as no longer basic but intermediate topics and for which it is required that you first know the general and essential aspects of this website development program and for which "Softaweb" was created precisely. As for the points that would be removed from "Softaweb", the majority made it clear that the tool was made complete just as it was given to them, so they would not remove any module in particular because they are all necessary, although a comment that caught my attention a lot attention was that of a user who wrote in his answer that he would remove the animation resource because with pure reading supported by images and video, it was enough to be able to learn the topics of each "Softaweb" module in a

satisfactory way. This opinion mentions again that the videos were the materials with the greatest acceptance among the set of materials that were offered to support each specific topic of web page development.

70% of the users perceived that the "Softaweb" multimedia support tool was developed with an "Excellent" quality since it met the requirements of adapting to the interface of the Microsoft Windows operating system, which makes it an easy-to-use program since it presents the characteristics of any program that is installed under Windows: it is installed together with the other programs already installed on the computer, it can be minimized, maximized, it has option menus, it has hot keys, it is made up of materials that can be they can display full screen and printable readings, etc. It is also a quality multimedia product because it has those points that good educational programs must have, such as: ease of use and installation, the quality of the audiovisual environment, the quality of the contents, good navigation through the materials, ability to motivate students to learn in a self-managed way, adaptation to the pace of work of users and support documentation on how to use the tools.

Also as a good Didactic Educational Software, "Softaweb" fulfilled the informative, instructive, motivating and evaluative functions and thanks to the comments of the participants we were able to verify these aforementioned points.

Finally, the students were asked if this type of tools could replace the face-to-face intervention of an advisor or teacher in terms of learning support, which only half of them (50%) mentioned to us that they did not. It was necessary to have an expert by your side when learning a new topic. The other half agreed that even with these support tools it is necessary to have a teacher for any doubts that may arise, which indicates that multimedia tools, at least in CUValles, can be of great support for the self-managed learning of the students but that they are not prepared to learn 100% in a totally self-managed and autonomous way.

Final comments of the author (Conclusions)

As part of the administrative and academic staff of the Centro Universitario de los Valles, the undersigned decided to solve an educational problem of the students of the

fourth semester of the degree in education, developing a technological material supported by multimedia to function as a tool that would promote the Self-learning focused on the development of web pages.

Although it is true that the importance of multimedia has been discussed in the new teaching-learning schemes and that they are of great support for non-conventional modalities, it is also true that tastes, culture and culture must be taken into account. the approach that users have towards educational technologies and towards independent and distance study so that a didactic material of this type is a success and is accepted by the students.

"Softaweb" was tested and evaluated by students between the ages of 18 and 20, who had a computer at home and who were interested in knowing and learning about the world of website development.

The results presented here illustrate the feasibility of using products with multimedia support that will allow CUValles students to self-train in the use of computer programs and, why not, in other topics such as language learning, mathematical topics, accounting and accounting topics. the other degrees that are offered in this University Center.

The good results about the approval of "Softaweb" by education students was partly because it would help them solve a problem in their professional training, since learning to use computer tools for the elaboration is not contemplated in their study plan. of web pages, this motivated them to take into account the multimedia tool as an object of facilitation of learning and in another part because the experimental group, despite the fact that it was only studying the fourth semester, has several people who are distinguished by their self-management, investigative, proactive, critical capacity but above all with a taste for independent learning. This is linked to the premise that if at CUValles we want the materials that are developed for students to support their

training to be well used, it is necessary that students have the characteristics and roles required in non-conventional learning schemes.

An interesting result is shown in figure 6 in which only 50% of the participants agreed that tools such as "Softaweb" can replace the teacher's face-to-face intervention and encourage self-learning and independent study.
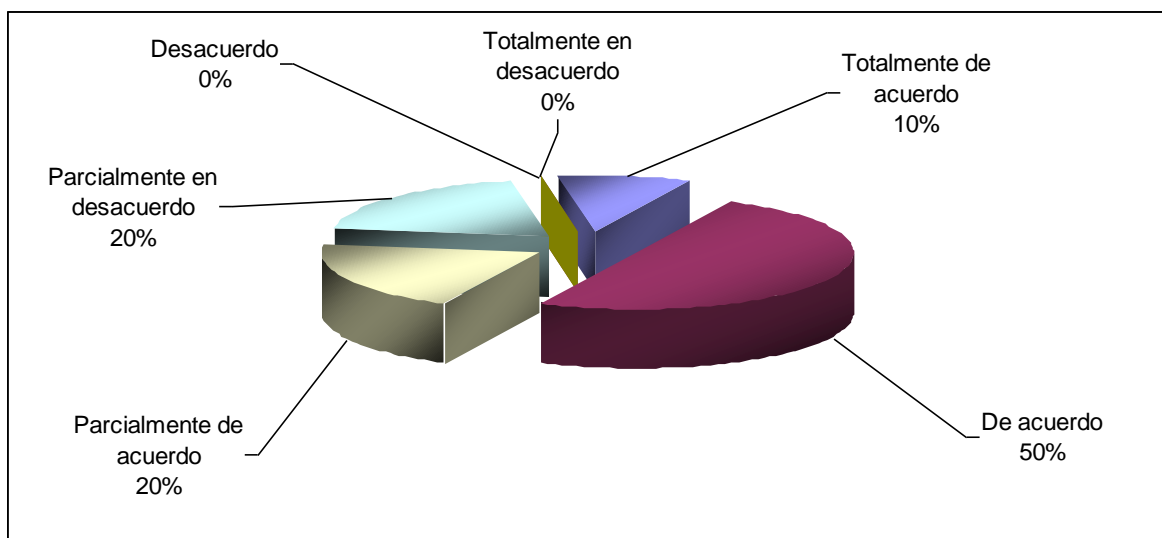

Fig. 6. Results of question 15 in the "Softaweb" evaluation tool by users. With the support of multimedia software for learning in the development of web pages, do you ¿consider that it can replace the face-to-face intervention of the teacher?

The other 50% of the evaluators commented that although it is a good strategy to use multimedia to offer training materials, it will always be necessary to have a person related to the particular topic to resolve any doubts that may arise from the training. study of each of the modules. With these comments, the possibility that CUValles offers subjects 100% remotely or online is ruled out, since the students are still accustomed to the study scheme that they have been dragging since primary school, in which they hope to have the support of a teacher or a adviser; but this does not mean that materials for self-management and independent support should not continue to

be produced, rather these points of view should be taken into account to improve the academic scheme of CUValles in which face-to-face study in the facilities is combined of the campus and the personal study at home and the academics can prepare support materials for when the students study at home and in the classroom, they make the most of the time and only doubts are resolved and exercises that consolidate learning are practiced.

The opinion of the students in the experimental group coincided in pointing out the benefits of having multimedia tools such as "Softaweb". There were several comments to continue developing this type of material supported by multimedia but to be used in other subjects or to learn other computer programs. Regarding the multimedia resources used in each module (reading, animation, video and exercise), the students indicated that the one they liked best was the video resource because in an audiovisual way they saw and heard how to perform the procedures that were asked to be done. applied in practical exercises; Given this, it is necessary to add that several students argued that in order for what was seen in the multimedia resources on the elaboration of web pages to be more retained, it was necessary to practice, practice and practice and thus consolidate the new knowledge rescued from reading, animation and video.

The multimedia product was also tested and evaluated by an expert in pedagogy who commented that "Softaweb" complies with the pedagogical and instructional elements that make a material a quality tool and great support for autonomous study. Master Carlos Quintero Macías argued that the way of distributing the information by modules and the gradualness that they show as they progress allow the student to learn little by little in this topic of web page development. One point to highlight is that the learning objectives, the information shown in the resources, the exercises and the points of the self-assessment were perfectly linked, what our pedagogue colleague called: Evaluation by objectives.

Regarding the technical aspects, the multimedia tool was also tested and evaluated by an expert teacher in the systems area and who endorsed the way of presenting the resources, the "Softaweb" interface and its final presentation as a desktop application. She told us that it is an easy-to-use product that allows even beginners to learn how to use the Macromedia Dreamweaver program in a basic way. Teacher Eréndira Álvarez Tostado Martínez pointed out the benefits of applying technology to the use of education and generating new teaching-learning schemes in teachers.

With all these comments, expressions, results and answers we can say that the multimedia materials can be considered as important complements in the education of the students enrolled in the Centro Universitario de los Valles and not as substitutes for the teachers; that they can present a large amount of information but in a pleasant, graphic, visual or auditory way; that generate autonomous learning environments but that are only attractive to the user as long as it helps to solve a problem related to their academic, professional or personal life.

Finally, it is necessary to mention that more advantages than disadvantages can be expected from incorporating this type of support tools both to the didactics of the teachers and to the learning of the students.

The results of this technical-didactic work showed that it is possible to support autonomous learning with the use of multimedia and especially audiovisual-type resources. Innovative didactic proposals are necessary in educational centers, especially those that handle non-conventional modalities.

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