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ABSTRACT

One of the most promising possibilities of the World Wide Web resides in its potential to support distance education. In 1996, the University of Las Palmas de Gran Canaria developed the "INNOVA Project" in order to promote Web-based training and learning. As a result, the Virtual Classroom Interface (IVA) was created. Several software tools for developing Web-based training were analyzed, and WebCT (World Wide Web Course Tools, University of British Columbia) was chosen as the main development tool. IVA is a WebCT-based common interface that works as a rapid online course development tool. It provides an organized set of educational and administrative tools to make it easier for faculty to implement online courses. One supporting computer application developed on this platform is called SISTRAT. SISTRAT methodology aims at formally supporting the strategic planning process, aiding students in the business administration curriculum in simulating strategic analysis and guiding the students on a continuous basis through the different stages that conform to a strategic plan. The SISTRAT course is organized around one main homepage that is the entry point of the course. The SISTRAT course incorporates not only the general IVA features, but also a set of specific items pertaining to strategic planning. IVA educational tools included in the SISTRAT course include: course bulletin board; electronic mail; chat tool; student self-evaluation; glossary; page references; and progress tracking tool. (Contains 10 references.) (AEF)

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Virtual Classroom for Business Planning Formulation

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Abstract

One of the most promising possibilities of the WWW resides in its potential to support the long distance formation. The Web Based Training (WBT) acquires thus a high importance as a learning tool. In 1996, the University of Las Palmas de Gran Canaria developed the "INNOVA Project" in order to promote Web based training and learning. As a result, the Virtual Classroom Interface (IVA) was created, and WebCT (Word Wide Web Course Tools) was chosen as the main development tool. One application developed on this platform contemplates the academic instruction in business from an innovative perspective. The application, named SISTRAT, reinforces the teaching-learning process, guiding the student on a continuous basis through the different stages that conform to a strategic plan.

"[...] it can be predicted that in the next fifty years, colleges and universities will change more and more in a dramatically way [...]. These changes will be partly imposed by new technologies [...], partly because of the demands of a knowledge based society in which the organized learning process should become [...] a process that will last a lifetime"

Peter Drucker (1996:78)

Information technology as a support tool for learning

Since the invention of writing there has been a continued passing parade of new technologies, each of which is claimed to have the potential to "revolutionise learning". These technologies are released in a flurry of excitement but often end in disappointment when evaluation studies fail to reveal the much anticipated improvement in learning. One of these technologies was the introduction of computers to learning.

Early evaluations studies of Computer Based Training (CBT) began to appear by the late 1960s and early 1970s, which in general supported the effectiveness of computer-based teaching as a supplement to conventional instruction. CBT was reported to reduce the time required to learn and to be effective in teaching mathematics and a number of other disciplines (Kulik *et al.* 1980).

Clark (1983), in a review of a number of similar studies questioned the methods of instruction used in the "experiments" and suggested that CBT authors had simply computerised methods of programmed instruction rather than capitalise on the possible "added value" of using computers. It seems them surprisingly obvious that there is no reason to expect the quality of learning to be improved if we simply transfer a learning experience from one medium to another.

Clark and Craig (1991) responded to these claims with a survey of multimedia and interactive videodisc research, drawing a number of conclusions including "multiple media, including videodisc technology, are not the factors that influence learning; the measured learning gains in studies of the instructional uses of multiple media are most likely due to instructional methods...".

And now the latest in this long line of learning technologies is the World Wide Web (WWW). The greatest potential of the Web, however, lies in the fact that we have a chance to learn from the lessons of the previous faded technologies, and at the same time an opportunity to develop new learning experiences for students which had not been possible before. Firstly, let us consider those which can be critical factors in the learning process.

Biggs and Telfer (1987) suggest that the following kinds of teaching foster deep approaches: an appropriate motivational context, a high degree of learning activity; interaction with others, both peers

and teachers, and a well-structured knowledge base.

Laurillard (1993) discusses a number of key aspects of learning that can be used in any discussion about teaching strategies. These aspects are:

1.-*Apprehending structure*. Students construct meaning as they read, listen, act and reflect on the subject content. However, as Laurillard points out "Meaning is given through structure" and it is therefore essential that students are able to interpret the structure of any discourse before they can construct the meaning that we have previously seen to be so crucial to understanding.

2.- *Integrating parts*. Students need to be able to integrate the signs of knowledge such as the language, symbols and diagrams with what is signified by them.

3.-*Using feedback*. Actions such as those mentioned above are futile for student's learning, unless feedback on individual actions is given.

Consequently, the challenge for educational developers is to use this knowledge of learning, together with an understanding of the features of the WWW in order to design learning experiences which promote a deep approach to learning so that "what" students learn is a deep understanding of the subject content, the ability to analyse and synthesise data and information, and the development of creative thinking and good communication skills. There are a number of features of the World Wide Web that determine the way in which it might be used for teaching and learning.

Web Based Training

After shellacking the World Wide Web with advertising and marketing content for the past years, businesses are starting to recognize the potential of the Internet as a training and educational tool. In a sort of returning-to-its-roots fashion, the Internet, which was originally formed to bring together scientists and research institutes, is now being tested as a medium for conducting computer-based training, more commonly known as CBT.

CBT and long distance learning, which typically requires a videoconferencing link between trainer and students, can be used in a variety of ways. For example, many companies rely on CBT materials to train employees to operate equipment or to familiarize new employees with company policies. Although the first CBT classes were conducted on mainframe computers, the CBT market took off only recently with the advent of multimedia technology such as graphics accelerators and CD-ROMs. Compact discs, which can hold more than 650 megabytes of information, have enabled trainers to enhance the learning experience with rich graphics and video and audio clips.

The big expense associated with CBT is the distribution of diskettes or CD-ROMs to learners or even to corporate networks, where a single CD can be shared among several users. Although an effective tool for delivering multimedia-based instructions, read-only CDs cannot be updated and require to press new discs in order to add or update course materials.

The Internet, on the other hand, enables to store instructional materials in one location (an internal or external Web server) and make frequent and timely updates to time-sensitive material as needed. A major feature of the WWW is the potential for developers to create links between text and other media, not only within an individual document but also between documents residing in any computers in the world which have access to the Web.

One approach to using these features for teaching/learning is to create documents which contain hypertext/ hypermedia links which the learner follows in a sequence which is often unique to the individual learner. A second approach to the use of hypertext programs is to take advantage of the interactivity, a capability which has been claimed to provide a useful strategy for active learning.

A third approach to the use of hypertext/hypermedia links on the Web is to encourage learners to become collaborative authors. Opportunities are provided for learners to contribute to the creation of

documents on the Web by attaching their own data in form of written or oral commentaries, either still or moving images, or alternative links which are then also available for other learners to read/follow. Thus by apprehending structure, integrating parts and using reflection, learners develop an individual interpretation of reality.

A fourth approach is to use a range of Internet services so that an integrated learning experience is provided. Students can use the Internet to communicate with one another and with the experts as they discuss a variety of issues. The learning strategies adopted here fit very well with Biggs and Telfer's comments about the importance of appropriate motivational contexts, a high degree of learning activity; interaction with others, both peers and teachers, and a well-structured knowledge base.

Finally, there is a great deal of research available to WWW developers, not only about the way people learn and the strategies that promote the kind of learning we value, but also the lessons learned by earlier technology developers. If we use this knowledge to inform our practice, the students of today can look forward to new learning experiences which will not only provide them with an education, but also with a capacity for life-long learning as well (Alexander, 1995).

Innova project: the virtual classroom

In 1996, the University of Las Palmas de Gran Canaria proposed an "*Education Quality Improvement Plan*". The Computing and Communication Centre (CICEI) developed the "INNOVA Project" in order to promote Web based training and learning and to capitalize the University investments on its corporative ATM network. This project affects, in its initial phase, to more than 4,000 students and in it participate about 37 people among faculty and support staff.

As a result of the INNOVA Project, the University of Las Palmas Virtual Classroom Interface (IVA) was created. Several software tools to develop Web based training were analysed, and finally, WebCT (Word Wide Web Course Tools -University of British Columbia-) was chosen as the main development tool. IVA is a WebCT based common interface that works as a rapid online course development tool. It provides an organised set of educational and administration tools to make it easier for the faculty to implement online courses.

WebCT was first presented at the Fifth International World Wide Web Conference in Paris, France, in May, 1996 (Goldberg and Salari, 1997). WebCT is a teaching module that works within a Web browser. It provides the instructor and the students with many capabilities, not only the ability to post documents in HTML format, but also the ability to create a document file that students can easily download, a grade tracking module, and a calendar. Most useful, however, are the parts of the program that facilitate interchange between the students and the professor: e-mail and bulletin boards. On the one hand the e-mail function is simple and would be familiar to anyone who uses any e-mail package, but its power lies in allowing the student to easily correspond with either an individual, a group of students, or the entire class without having to collect and compile each students' e-mail address. On the other hand the bulletin board enables the professor and the students to post thoughts, comments, exercises, papers, and so on in a public forum.

The IVA interface benefits from most of the WebCT features and, furthermore, offers the advantage of being a Spanish-language adapted interface. IVA was developed under permission and cooperation of the authors, and as result of this cooperation, the CICEI's server currently holds the european mirror for the WebCT. Interactivity, structure and educational tools are provided by IVA, though these are all configurable by the course designer. In all there are three main aspects of IVA:

- 1.-A presentation tool that allows the course designer to determine the layout, colors, text, counters, etc for the course pages.
- 2.-A set of students tools that can be integrated into any course. These tools include communication tools, student evaluation and self-evaluation tools, student collaboration and presentation areas, course navigation, account administration tools and more.

3.-A set of administrative tools that aid in the delivery of the course. These tools include student progress tracking, course access tracking, on-line quiz creation tool, grade maintenance and reporting tool, and more.

As an example of innovative implementation, the next paragraphs describe briefly the application of this tool for the design of an undergraduate course about strategic planning in a business administration curriculum.

Strategic planning learning

In every business administration curriculum an ever present subject is strategic management, a subject focused on the formulation, implementation and control of the strategies that allow the future development of any organization. It can be said that of these three parts in which it is generally divided (most of the course programs and text manuals of strategic management are so structured), that concerning the formulation of strategies (strategic planning) usually requires the longest extent when compared with the other two. That is both because of the importance of the strategic planning into the strategic management field as well as the complexity of such a multi-stage process in companies (Hax and Majluf, 1984).

Centering on the particular objectives to be reached in the development of a strategic management course, García Falcón (1993) categorizes them in the three following groups: (1) knowledge transmission related objectives, (b) aptitude teaching related objectives, and (c) objectives related to attitudes to be developed into students. The list presented by the above mentioned professor, which includes both quantitative and qualitative variables, contributes to justify the inclusion of a strategic management subject in the academic program of any business administration degree. At this point, let us exclusively focus on those objectives the accomplishment of which can particularly be well supported by a tool with similar characteristics as the one presented in this paper. These objectives can be summarized as follows:

1.- *Objectives related to the knowledge to be transmitted:* to identify the different levels of strategic analysis and to assume the need of coherence among the decisions taken at corporate, business and at a functional level; to analyze how the internal reality and the external environment influence the company operation and, definitely its results and performance.

2.- *Objectives related to the aptitudes to be taught:* to be qualified enough in order to analyze the external and internal events of the organization, thus identifying external opportunities and threats, internal strengths and weaknesses, as well as competitive advantages and disadvantage

3.- *Objectives related to the attitudes to be developed:* to maintain a general and non-specialist knowledge of the company and its problems, learning how to integrate different concepts already studied in other administration disciplines. The purpose is just to teach the importance of making decisions from a general perspective, overcoming departmental frontiers.

SISTRAT methodology

In the next paragraphs will be described the main features of a research line conducted at our University. This is aimed to use the information technology in support of a business administration subject as it is the strategic planning. As a consequence of this research a methodology for strategic planning has been developed, and a supporting computer application -that we have named SISTRAT- has been designed.

The main challenge in this research line was how to provide students with a useful tool both to let them learn the basis of strategic planning and simulate the decision making process in low structured and highly unpredictable environments. Accordingly, SISTRAT methodology aims to formally support the strategic planning process, aiding students in simulating strategic analysis and the definition of activities at the different organizational levels.

Implantation of SISTRAT on IVA

The SISTRAT course developed using IVA is organized around one main homepage. This home page is the entry point of the course (the first page that students see after having logged on to the course) and contain, among other things, a banner image, a textual message, a message of the day, links to course content elements, links to course tools and links to supplementary homepages. IVA provides a set of educational student tools that have been incorporated into the course. The designer activates these tools by placing the icon representing the desired tool on the homepage.

The SISTRAT course incorporates not only the general IVA features but a set of specific items pertaining strategic planning. These include theoretical documentation about related topics (i.e. mission statement, competitive environment, internal analysis, *etc*), a glossary of terms, a case study and, finally, a supporting computer application for applying both concepts and the case study making use of most relevant tools usually adopted for the strategic planning. To sum up, the objective is to link theoretic concepts with a computer application for supporting the strategic process in a working environment where students can participate in an active manner posting thoughts, comments, chatting in real-time communication and making use of multi-fora asynchronous electronic conference.

Following, a brief description of several IVA educational tools included in SISTRAT course is provided: (a) *course bulletin-board*, which has been created for cooperating groups of students making use of a number of icons placed on separate pages the appearance of which reflects whether there are unread messages in the bulletin board; (b) *electronic mail*, allowing one-to-one message transfer among course participants; (c) *chat tool*, for real-time communication among students intended both for casual conversations among course participants as well as for tutorial sessions held on-line by instructors; (d) *student self evaluation*, supplementing content pages with multiple-choice questions, which are automatically marked as correct or incorrect by IVA; (e) *glossary*, showing a list of terms according to the letter they begin with; (f) *page references*, which consists of a database containing references to learning resources such as papers, textbooks and URLs, and finally (g) *progress tracking tool*, which maintains detailed information regarding accesses made by each student to the course.

Conclusions

Companies and educational centres that wish to distribute primarily text-based training materials which do not require data-intensive video or audio components can move their course materials to Internet today. Although bandwidth constraints are likely to be a concern for some more years, emerging technologies, that make efficient use of existing bandwidth, have helped the migration of multimedia-based CBT to the Web. Applications like WebCT have proved their suitability for the creation of sophisticated World Wide Web-based educational environments. We deeply believe tomorrows' education will need more flexibility and should give the students the opportunity to learn in an interactive way. We think the answer can be found in the information technology, being the WWW one of the maximum responses to this challenge that exists nowadays.

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