

DEVELOPING SKILLS TEACHING AND LEARNING USING WEB STANDARDS AND INTERACTIVE 3D VIRTUAL ENVIRONMENTS AND MULTIMEDIA TOOLS

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Abstract

Due to the fusion of computers and telecommunications and the expansion of Web, information has grown exponentially around the world, which has brought about the development of individual's skills for understanding and synthesizing knowledge, applying them with effectiveness.

Currently the field of information technology has offered a lot of flexibility for individuals improving their talents using high-tech tools, which are cost-effective for developing individuals' virtual learning, sharing knowledge, creating and distributing content.

With the fast-moving of cyberspace's technologies, exploring the theory and practice of such technologies for teaching and learning will give the individuals the opportunity of experiencing concepts such as learning how to learn and lifelong learning.

The designing of information systems requires the application of techniques from experimental psychology like exploratory learning, which is the combination of problem solving and learning behavior, covering trial and error and instruction taking activities (Reiman & Young, 1996).

Several educational documented examples, mass media and Internet applications support the argument of employing multimedia tools, as well as virtual environments and their 2D and 3D interactive technologies such as HTML and VRML for a high quality Education. For instance, VRML is a language for implementing 3D models on the Web. It is designed to complement the communication on the Internet environment in a creative, dynamic and interactive way. Furthermore, VRML is cost-effective, its files are portable, reusable, supporting integrated multimedia (audio and video files)(Ames, 1997).

This paper proposes that using multimedia and virtual environments tools can enhance the quality of open learning and distance education, as well improve communication among school members (teachers and students) and the outside community, supporting individuals' development of human and technical skills together.

Employing the state of the art of technology and humanity for sharing knowledge can improve respect and communication in the human interaction, as well generating creative, dynamic and better prepared people for effective professional life (Franco, 2000). For achieving these goals is fundamental that family, school, public and private sectors work together in a synergy network.

1- Experiencing HTML at school teaching

This paper is based on the convergence of experimental, open and virtual learning, as well as traditional education paradigms. It was carried out recently with students from 14 years and older at Guiomar Cabral School in São Paulo. It was used HTML as a tool for teaching English, developing content including teacher and students computer skills together. The idea came from the necessity for motivating children to study more, since HTML 's commands are in English and produce content using at school environment a world tool that has been employed with effectiveness to make individuals buying, entertaining and educating.

The use of HTML first generated a talk between teacher and students for understanding why not just save a document as (html) file, but start to understand the cyberspace's basics. It was also discussed following the education tendency to less traditional class, employing a constructivist and learning centered approach, developing Internet programming capability and other skills together with novelty, fun and usefulness

(New Routes, 1999). The reasons explained and accepted by individuals were to understand better the cyberspace, developing tasks with hands on the tools, generating content based on the school's curriculum, and gaining as many abilities were possible.

After four classes working basic HTML, students started developing their group task, which was to create for the market a product in the company organized and directed by a group of students. They should design the product, make it feasible for a classroom presentation, and show it in a home page as advertising. They had as a condition for succeeding in the task elaborating everything by hand, such as drawings using Paint package, text using HTML tags for understanding better this language that is very important in the cyberspace, including to employ HTML multimedia capabilities such as audio and video.

The task's development generated more integration between students and teacher, including real life learning application. For example, research in dictionaries and HTML books, communication with individuals outside school for understanding how to organize a company, create and maintaining a product in the marketing, brain storming sections for the designing of multimedia products such as in (Laurel, 1990).

The assignment was conducted during two months alternating English classes working language issues such as ways for expressing ideas in a second language and classes exploring the computer Lab resources for the construction of the task. Some students had further knowledge in HTML and they shared it with the teacher and other individuals in the classroom.

The results can be considered satisfactory, since the production of tasks evolved and reflected several students' professional tendencies while they were developing the work. Furthermore, students worked in teams sharing their common interests and knowledge for achieving their group goals. For example, students designed and prototyped their Web pages for several industry's areas such as cartoons, fashion, car sales on line, industrial artifact projects and artesian simulation (airplane, beauty products, weapons and so on). They also applied HTML knowledge much deeper than the initial examples given by the teacher, improving task's quality.

The techniques used during the work development such as face to face plus virtual classroom, including multimedia such as audio-graphics and video. That resources were enriched with text books, course notes and collaborative work, aiming to reach and develop the various individual's skills better supported and discussed in (Hiltz, 1995).

The first HTML file used for introducing the language to students in the work, which has been described above, is adapted to this paper and reused on (figure1).

*For working with HTML and later with VRML, browsers such as Netscape 4 and Internet Explorer 4 or later versions are adequate. Create a directory, for instance, called **net** for saving **the example files**. For producing an HTML file uses a word processor of your preference, type the file below and save as **file name.html / Text document**. If one is using Windows operating system then go to Windows Explorer and click twice on the icon. In this first example the exercise proposal is to create a page using HTML with a link to a VRML example of the third section). But it is possible create tables, associating sounds (mp3 or wav) to the images (jpeg or gif), for instance producing a talk dictionary. For more references consult (EVEX site, 2000) or HTML tutorials on the Internet.

```
<HTML>
<HEAD>
<TITLE> My 20th World Conference page </TITLE>
</HEAD>
<BODY BGCOLOR="#ffffff">
<P><center></center></p>
<P><FONT color>Hello Dusseldorf! My first page on the Web
to be presented in the 20th World Conference on Open learning and Distance Education!</FONT></P>
</BODY>
<A HREF = "C:net/world.wrl"> VRML example </A>
</HTML>
```

Figure -1 HTML example

2- Technology influence and educational development

In a world where data increases exponentially each year, a major challenge for schools is to appropriate students to access and use information effectively. This requires a refocusing of current uses of multimedia in the curriculum, from engines for transmitting massive amounts of data, to tools for structured inquiry based on higher-order thinking. Reconceptualizing multi-media now is important because, over the next decade, the fusion of computers and telecommunications will lead to the development of high realistic virtual environments that are collaborative and interactive. The evolution of this “meta-medium” will enable virtual worlds that immerse students in information-laden virtual worlds. Such learning environments risk overwhelming their users unless they incorporate tools that help students and teachers to master the cognitive skills essential to synthesizing knowledge from data (Dede, 1992).

The Internet is currently an essential component of research and teaching tool. Combining up-to-the-minute research and data with fast, global communication, forming the base for an efficient, powerful and flexible state-of-the-art education resource. In the beginning the Internet was provided only for the university and college domains because they were founded by research organizations, which elementary and secondary institutions had rarely access. The types of infrastructure grants that enabled universities to build the systems necessary for high-speed Internet connections simply were not available to educators at the lower level (Randall, 1995).

Fortunately, the situation has been improved and Internet and its resources currently can be accessed in all levels of the education domain bringing about more resources for the construction of collaborative teaching and learning environment (Jervis and Steeg, 2000). Thinking about human interactions and development, the sense of equality for sharing technical resources will have further influence in the collaboration and integration between all educational levels, improving the network of knowledge inside the education, meaning better prepared teachers and students.

The Internet is naturally a collaborative environment, which is designed for grouping different platforms such as UNIX and Windows, programming languages like C++ and JAVA, including its markup languages HTML and VRML. This multiform scenario is distributed through a network using protocols such as TCP/IP, synthesized and organized in a browser before delivering to individuals the data requested. Teaching and learning based on this collaborative virtual environment can enhance individuals’ computer skills, awaking them about the possibilities, benefits and limitations which evolve the use of these technologies, as well as improving their creativity for dealing with information and developing content with high quality.

On the other hand contemporary education has immobilized students and pits itself against the children’s need for activity. It assigns meaningless exercises whose results are thrown away and never asks children to accomplish anything that is useful to others, but using multimedia and virtual environments tools such scenario can be dramatically improved due to the broad range of generative possibilities offered by these tools (Krueger, 1993). Educators have faced with the dilemma of providing a high-quality education with less funding, with more students in classes, with cuts to social programs forcing the schools to provide these services, and so on. Along with these changes comes the challenge from the business’ world demanding that its future employees, the students now, be educated to keep up with the rapidly changes and advancements of technology to be competitive in a global economy. And again, these challenges have pointed to a teaching and learning using electronic tools, which currently have integrated traditional Web development and interactive TV link throughout HTML, a graphics program, a standard FTP software, a TV viewer’s set-top box for building interactive entertainment and e-commerce content (Krebs et al, 2000).

However, educational changes also have come from educators themselves, who realize that for transforming the system is necessary to cope with the students who are faced at school every day. Educators have looked for ideas and tools that enhance teaching and learning environments. For instance, educational projects have been carried out new and creative ways for teaching literature, science or math, including how to read through writing using VRML and 3D tools applying exploratory learning techniques. It includes to teach and integrate students with learning disabilities within the regular classroom employing

the concept of intelligent agents, virtual reality, multimedia and virtual storytelling (Brna, 2000, Upenn 2000, and Inman, 2000).

Another issues such as finding out methods for conflict mediation and resolution strategies with and among students; including techniques to expand the curriculum to be more inclusive of gender, race, and sexuality, can be improved using flexible tools at classroom like virtual environments and multimedia (Vrieze, 1998). However, for employing these tools as teaching and learning instruments it is necessary to introduce this knowledge in great scale to teachers. The master teachers' understanding and integration of these flexible tools in their teaching subjects with effectiveness will lead them to be able to improvise as in a jazz concert, highlighting teacher's professional development according to the educational expectation for the 21 century (Serim, 1996). These ideas address the necessity for collaborative, constructivist education, including a student-centered and instructor-mediated curriculum (DeVarco, 1998).

In the daily life several tools and techniques have been employed such as consumer multimedia devices (videos, digital cameras etc.), computer hardware and software and the Internet among others. Through these devices and tools 3D environment representations enjoyed success, including video games and educational software for teaching and sharing knowledge in a more interesting manner. The current facility of employing conventional desktop at schools linked in an Intranet or on-line (Internet) makes virtual environments a potential tool for revolutionizing education. For example, in the NICE project students experienced both immersive environment in the CAVE[TM] and conventional desktop activities, extending then the experiment's to individuals via distributed virtual environments, which is in this particular case a combination of Internet communication protocols such as TCP/ IP and standard languages like VRML and JAVA (Roussos, 1999).

Due to the success of virtual environments and 3D technologies in commercial sites, video, games, simulation and training applications, this paper suggests that using multimedia, virtual environments tools during school activities may bring more motivation, interaction and communication between teachers and students. The employment of virtual environments as well as their 2D (HTML) and 3D (VRML) technologies including multimedia tools in education can give a new dynamism and much more quality in the way of teaching, providing opportunity to revolutionize what is taught, as well as how it is taught (Krueger, 1993).

3 – 3D VE, VRML and Multimedia: flexible tools for creative teaching, learning, and cognition

VRML is an acronym for the Virtual Reality Modeling Language. Using VRML ones can craft their own interactive three-dimensional virtual worlds on the Internet. Individuals can build their own virtual rooms, buildings, cities, mountains, planets and fill them with furniture, cars, people, spacecraft, or anything else one can dream up. One's imagination is the only limit. The most exciting feature of VRML is that it enables one to create dynamic worlds and interactive virtual environments on the Internet, including the ability to animate objects in the virtual worlds, play sounds and movies. Developers can control and enhance worlds with *scripts* (small programs developed to act on your VRML worlds) and share with others through the World Wide Web. A VRML file is a textual description of a VRML world that one creates using a word processor that instructs a Browser such as Cosmo Player on how to draw and animate 3D shapes in a virtual world. VRML is an open standard and its use can be cost-effective (Ames, 1997).

The flexibility of VRML enables developers to embed other multimedia elements like audio, video and bitmap files created in various software packages as art packages such as PhotoShop, CorelDraw and 3D Studio Max. This characteristic makes the language useful and acts as a powerful tool for creative teaching and learning. For example, in areas like *design* and *technology* its use will help teachers and students to build 3D scenes and apply movement to the objects, visualize and walk through their work, observing the objects at several angles, and if necessary change their position and attributes. VRML teaching and training material and tutorials can be found at (SCDS, 2000) and other sites.

Using multimedia and VRML related tools at school can add more interaction, creativity and enhance communication in the classroom. By employing tools like video and photo cameras, CDs, record players,

microphones, computer hardware and software for teaching and learning effectiveness individuals will develop their skills in active mood, rising knowledge by learning through experiencing situations similar to those in the real world. They will reflect about their actions and then construct conclusions. For example using an Intranet at school, teachers and students can practice how to work with browsers like Netscape and Internet Explorer and understand browser functionality.

After training with browsers, they can build VRML files using a word processor like WordPad and see them in the browsers as 3D models. It is quite easy and fun to build VRML files because these actions can generate an atmosphere of curiosity in the classroom, stimulating research for composing the VRML world and interaction among students and teacher. In a collaborative work students can exchange VRML files by diskettes or Intranet, discuss if the content of their virtual worlds are according to the subject studied, and improve their worlds' model quality with third party material created, using consumer devices like record players and photo cameras. They can simulate how to navigate, research, download and save files, as well as analyze and design Web pages and their delivery raising their awareness about cyberspace before surfing on the Internet (Franco, 2000).

It is thought that the design and delivery of teaching material based on multimedia and Web technologies, and linking them with subjects of the national curriculum can improve education quality. Using authoring and third party video, text, audio, graphics and VRML files can enhance students' skills and motivation for learning, by exploring their cognitive abilities or multiple types of intelligence (Gardner's theory). The theory is supported by his studies about brain structures, diverse cultures, evolution, children development, and individuals with exceptional abilities, not just IQ tests. For example, the existence of prodigies (people who are generally normal, but precocious in a specific domain) and idiot savants (people who are mentally retarded, yet extraordinarily talented in some way) tell us it is possible to have one kind of intelligence and lack another. Gardner defined intelligence in six types (figure2): linguistic, logical mathematical, spatial, musical, bodily kinesthetic and personal (Kassin, 1995). Having flexible tools for teaching might support access and train different individuals' skills. It is very important that children acquire the skills, knowledge and attitudes today that they will need to function as fulfilled and contributing citizens tomorrow (Morgan, 1992).

Types of intelligence	Characteristics	Multimedia and 3D suggestions for generative tasks
Linguistic “...Love, children, education... “Children love education”.	It is related that a verbal aptitude that is rooted in auditory and speech centers of the brain, involving speaking, reading, listening and writing skills. Ex: Storytellers and poets that work meaning, syntax, sounds, inflections and rhythm.	Produce a VRML model employing image, audio, sound and text for advertising a new industrial product you have created. The expectation is to generate a task where students and teacher can use their communicative and computer skills, analyzing words in different contexts, voice tone.
Logical mathematical	The abstract reasoning ability for solving logical puzzle, programming a computer, breaking a complex code and working out an equation. Ex: Mathematicians, programmers.	Build a VRML model with primitives for showing division and proportion. Can be constructed also a model to explain abstractions and simulating experiences in Physics, Chemistry and Biology.
Spatial	It is rooted in the right hemisphere of the brain, consisting of the ability to visualize objects, find one's orientation on the space and navigate from one location to another. Ex: Visual artists, pilots and architects.	Create a VRML model designing a park, which should be ideal for you. A task for individual and group work, generating environmental research and possible discussion about nature and human preservation.
Musical	It is related to skills that control our reactions to pitch and rhythm, including ability to appreciate the tonal qualities of sound, composing, and play instruments. Ex: Musicians, conductors and singers.	Construct a VRML model with five objects and associate them to sounds. Yourself must link two of them with sounds you have composed. This task aims to develop students' skills related to audio consumer devices and communication.
		Prepare a text, dramatize and record it using a video

Bodily Kinesthetic	Localized in the motor cortex is the ability of controlling gross and fine movements. Ex: Actors, dancers, athletes and surgeons.	camera. Develop a VRML model where a 3D avatar can interact with it, presenting your video and explaining your classroom activities. This task goal is to practice computer, human interactions and multimedia skills.
Personal	Interpersonal - the ability to recognize faces and voices and non-verbal gestures. Intra personal – the ability to understand one’s own inner thoughts and feelings, understanding the causes and consequences of one’s behavior, and regulate one’s actions accordingly.	Develop a 3D model where the characters represent people’s daily facial expressions and non-verbal gestures. The goal during this task’s execution is to awareness students about individuals’ cultural and social differences, learning to respect them.

Figure-2 Types of intelligence, their characteristics, multimedia and generative tasks suggestions

VRML is applicable to individual and shared environments. VRML flexibility supports the development of content for a project in different computer stations at school or at home, allowing import of files to compound the final virtual work through different means such as diskettes, Intranet or Internet as if the users were part of the same enterprise. These actions and activities are interesting because they use principles of LAN and e-learning, improving computer and communication skills in the school community and preparing the individuals for their future working lives. Another important feature of VRML is the reusability of files and content in general, that saves time for employing these files in other teaching and learning process (figure-3).

VRML technical requirements	VRML file example	Software – Viewer procedure
-Processor 75MHz or better -16 MB RAM or better	<pre>#VRML V2.0 utf8 Shape{ appearance Appearance{ material Material{ } } geometry Text { string ["20th World Conference", "Dusseldorf Germany"] fontStyle FontStyle{ size 2.5 justify "MIDDLE" } } }</pre>	<ol style="list-style-type: none"> 1- Down load a VRML viewer “Cosmo player 2.1” for free on the Internet and install it. 2- Open a folder for your VRML document. 3- Open a word processor and type the example file and save it as .wrl –(text document). 4- Open the folder and click twice on the file and experience this first exercise. 5- * Please, take care about upper and lower cases when typing.

Figure- 3 VRML syntax

VRML knowledge acquired by children, teenagers and adults can be extended to applications external of the school group, such as friends and families. Such group activities are for sharing information technology skills at home and can support development social projects like PIN (Parents Information Network). For example a family can enjoy peaceful and creative moments of human interaction and learning while developing their computer skills. They may be creating a virtual scene where they can explore their family history and present places where their ancestors lived (country, city, castle, house, or farm environments). Scanning photos of family members and transferring these ones to the scene can increase the sense of realism in their virtual world.

4 – Virtual Environments, individual, educational and technical development

The technology is moving ahead, deeply influencing our daily life behavior in many areas, like business and communication. A multiplicity of technologies, predominantly associated with Internet will lead to the deconstruction of many traditional business models, and subsequently create opportunities for new

companies to emerge. Prepare individuals for enjoying these new opportunities and understand an information society is a task that evolves the society as whole (Karboulonis, 2000). Companies have been looking for individuals who are more creative, dynamic, and with better commercial computer skills. Improving school 's strategy from the primary up to the university courses can make a difference for enhancing individuals' cyberspace abilities and consequent development of skilled human resources for supporting the industry and individual's auto development in the next century (O'Brien, 2000).

However, the current generation of professionals has left universities mastering their subjects of study, but without the creativity and dynamic skills required by the business market. So institutions and educators can become part of the research and development effort for employing and exploring further the state-of-the-art of technology in the educational process for improving individuals' quality and ability to work with diverse sources and types of information (Osberg, 1993).

The information revolution has influenced the changes of the traditional school pedagogical paradigm, based on teacher-directed, to a constructivist concept learning process, learner-centered, task-oriented, interdisciplinary and trans-disciplinary, research and knowledge through computers, as well telecommunication between schools with teachers working as knowledge acquisition guides (Masetto, 1997). This process active rather than passive, where individuals construct their understanding of the world by experiencing, evaluating and incorporating their interpretations has been taken place in the education domain (Osberg, 1997).

More than ever, the world tendency of constant changes related to new technologies influences the daily life implicating in lifelong learning. The education domain can be a key factor for sharing knowledge and using technology around us with effectiveness and delight. Sharing knowledge occurs when people are genuinely interested in helping one another develop new capacities for action; it is about creating learning processes (Gibson, .1997). On the other hand, while the author was writing this paper, he was in contact with other teachers discussing these ideas. When individuals were told about the possibilities for improving the education domain using the technologies referenced on this work, they were interested, but in general individuals did not have enough information or either knew about the subject. So, this little research shows the necessity of introducing such technologies to teachers around the world.

Employing state-of-the-art technologies for enhancing the school education domain perhaps offer a unique opportunity for many children to access and learn how such technologies can support improvements in their quality of life and tale these experiences with them in the workplace. For example, the NIMIS project has evolved the best synergy of humanity and technology for supporting school beginners learning to read and write, using the concept of intelligent agents as base for interactive learning, plus multimedia interfaces, hardware and software suitable for young children. The project has been developed in a network of countries such as Germany, England and Portugal (Brna, 2000). More multimedia and virtual reality applications and projects related to teaching and learning examples can be found at (i3net, 2000).

Education is one of the most vital concerns of a society because it fundamentally addresses the perpetuation of humanity. All children go through a typically state-financed educational experience (Furth, 1999). As large number of children share the same school environment this leads to the fact that school is the most appropriate place to share and convey knowledge to them. The technical facilities of multimedia and 3D environments tools for exchanging files can support the 'kids' understanding the concept of sharing knowledge, improving citizens' quality for tomorrow's information society.

According to Don Tapscott, author of the book Digital Generation, it is very important for a good children's education reading and playing with other children. On the other hand, the generation Net has been using the Internet with effectiveness and certainly is better prepared in terms of knowledge than the older generations. Children who have been learning using the Internet, have practiced reading, reflecting, putting their taught in a context, being able to understand the media's power, criticizing and learning by interaction. They have a better self-confidence and social awareness, including individual civic and common responsibility deeper than their parents. Children have been using their spare time in front of interactive PC activities instead of watching TV, proven this way the individuals' tendency for sharing knowledge, humanity and technology inspired by the global network called Internet (Veja, 2000).

Another advantage of using 3D interfaces is that it makes possible to the user a three-dimensional spatial relationship to the information with which one is interacting. Since individuals live in a three-dimensional world, it seems natural that they use tools, which can help them to organize and perceive information and informational relationships in that way. Combining the rapidly increasing power of computation with the advances in the understanding of human/computer interaction, can be the chance for creating a fundamental new level of information interaction. This will give rise to the possibility of utilizing spatial memory and other psycho-physiological meaning to absorb, process, and synthesize information (Leftwich, 1993).

The NICE project (Narrative-based, Immersive, Constructionist/Collaborative Environments) is a good example, which illustrates how excellent can be the use of virtual environments as a learning medium within the context of the current educational transformations. NICE embraces the constructivist approach to learning, collaboration, and narrative development, being designed to utilize the strengths of virtual reality such as combination of immersion, telepresence, immediate visual feedback, and interactivity based on experiences with a wide variety of users children and adults. The experiences that have been carried out have shown good results and the project's researchers have recommended using the project techniques in large scale for better evaluation in different educational environments.

It is taught that associating computer skills to courses in universities can enhance the creativity and quality of the new professionals for using technology at school teaching or training in an innovative way. The application of these techniques can support the schools transformations and the learning to learn of institutions, teachers and students, as well as developing a new generation of skilled individuals. The necessity of flexible and creative individuals for the new type of jobs raising with the information era implicates in developing individuals' computer skills during their courses in combination with the subject of study. It is a great opportunity for join experience that comes from teachers and the technology resulting in high-tech quality education, developing a learning infrastructure that operates practical experimentation and testing, capacity building and diffusion, and standardization (Gibson, 1997).

Universities around the world that have information systems composed by the state-of-the-art of technology and experienced professionals could introduce innovative information technology teaching methods associated to virtual environments and their courses. Employing innovative teaching and learning systems can be useful for preparing better professional awaking them in large scale as recommend by researchers in the NICE project. Innovation can be cost effective if using Intranets associating them to each course's subject and employing open standard resources such as LINUX operation system, HTML and VRML languages. Advantages of employing new approaches are in enhancing institution images on the market in keeping the cutting edge technology in their courses. An example of cost effective employment of an open standard system in a high level application for costs reduction in networking development is the use of LINUX in The US National Center for Supercomputing Applications (NCSA) (Rees, 2000).

According to the researches that have been carried out, the future of educational domain will be linked with the latest developments in the computer software and hardware. The reason for this is that the fields of Artificial Intelligence and Computer Graphics including the concept of intelligent agents have influenced the work, which has been done for improving the user interactivity with computers. Good examples are: exploratory life-like avatars for performing user-centered tasks in 3D learning environments throughout an animated agent called "WhizLow" (Lester et al, 1999); the virtual theatre initialized by Laurel in 1991, developed by Bates in 1992 at Carnegie Mellon University and enhanced by (Hayes-Roth, 1995) at Stanford University. There she carried out investigation on improvisational computer graphics paradigm using lifelike intelligent agents for social improvements. For example, develop collaborative and distributed activities among children in different locations enjoying interactive storytelling experiences. Another example that integrates HTML, VRML, Internet communication protocols, multimedia audio and video files, highlighting the current state-of-the-art of human knowledge and technology pointing to the new concept of Intelligent Virtual Environments – IVEs is the IMPROV system (Perlin, 1996).

The future

The future is coming up with much more novelty and facilities for integrating the various communication channels joining standards, the Internet power, and the interactive television promises of enormous opportunities for education network, business, content providers, broadcasters, application developers and others in the television field (Krebs, 2000). Examples of how to create interactive TV Links to a standard Web page can be found at (Microsoft TV site, 2001).

Markup languages have also been improved and gained more flexibility and functionality for individuals' use including Web development. For example, HTML has been improved to its extension called XML. New standard languages extensions have been developed from markup languages such as VRML that is used to model imaginary worlds. The idea put forward is to migrate the features of VRML to XML throughout the application named X3D (VRML, 2001). There are other markup languages that have been developed for working with natural language in interactive speech applications (VoxML, 2001), describing graphics and is already implemented in Internet Explorer 5 the natural form of markup tags to draw shapes on a Web page and it is precursor to creating animations comes (VML, 20001). Other languages are a solution for representing mathematical symbols and their placement (MathML, 2001), for creating a database that can be searched via the Web (RELML, 2001) and for displaying information on openings jobs including posting of resumes Human Resources Markup Language (HRMML, 2001). The markup languages evolution described above will provide small files and easier way for transmitting data including connecting conventional wired Internet and wireless application protocol (WAP, 2001) on the Internet. With wireless devices such as palmtops and mobile phone accessing to educational content on the Web will have the same good quality of the current personal computers or better as the realism provide by consumer devices such as the video game PlayStation 2 from Sony (Rossi, 2000). The markup languages have the property of giving to individuals producing content, visualizing and interacting with it in real time.

Conclusion

Setting up an effective communication and information network will bring about improved teaching, training and family relations. For reaching these aims, a collaborative work of both private and public sector contributions is necessary. An example of an integrated network is the NIMIS project that integrates educational and business establishments.

The adoption of virtual environments and multimedia tools for creating interactive and widely shared content are thought to be the most appropriate tools for achieving the goal of versatile education, low cost and worldwide adoption for supporting individuals understanding and synthesizing knowledge. The concept of reuse as discussed earlier may also increase awareness of 'green' issues reflecting on the careful use of Earth's natural resources and the preservation of human life. It is also very important to present the new technologies to teachers, preparing them for applying computer and multimedia technological resources with effectiveness. Employing such technologies parallel to the curriculum's subjects, can keep students' attention, such as the industry and its 3D games do, giving rise to a new generation of skilled individuals able to live in an information society successfully (Niquini, 1996).

Children are our most precious resource, and as such they should be cultivated with the utmost care in well-planned, well-designed educational environments. If our goal is to assist the learning in developing knowledge, skills, and attitudes to join the society as functioning members, we should be looking towards the future with regard to the learning systems today. Virtual reality potentially provides such a rich, interactive, engaging environment (Osberg, 1993). Developing a synergy network including family, education, private and public domains for teaching them with the-state-of-the-art of humanity and technology worth it.

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