

Virtual Education in Training Environmental Engineers

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Abstract: - Today we are witnessing a spurt in the virtualization of education, the emergence of another „side” of it. We are dealing with a specific training or registration of a landing stage it’s virtual explicitly. This paper aims to capture the opportunities offered by the techniques of virtual reality technology and equipment for use in the processes of theoretical and practical training in the disciplines of environmental engineering in the curriculum. Propose a strategy for introducing the use of virtual reality for these types of educational activities, including specifying the necessary equipment and procedures for their use.

Key-Words: - virtual reality, virtual communities, cyber-space, technology, environmental engineering.

1 Introduction

Virtualization like processuality means the reverse update, the movement of a work or activities within possible future developments and whims of the spatial and temporal indeterminacy. It has nothing negative in itself, but belongs to the man power to design, to escape from the constraints of immediacy, of the given, this.

Virtual reality is a quasi-reality that has the look and functionality of a reality, but not reality yet, it’s kind of simulation and reality replacement. A virtual reality is the reality that has all the prerequisites to become (or to be taken as) reality.

In the first sense, virtual reality is a simulation of the world obtained by manipulation of models of structures of specific links. The new tool appears to be computer simulation, he a semblance of human brain function and performativity. [7]

Second, virtual reality is not simply reproducing specific real models, but opening a range of potential by overcoming properties real things. In a virtual museum, we can handle different paintings, entering their internal structure, which is unthinkable in a real museum.

2 Problem Formulation

Education as a process involved always relied potentiality. The purpose of training is aimed individual not present, but the virtual, as it was foreshadowed at a time. Present state not interested but rather what man had become in the future. Also, education was tempted not only update (behaviors,

attitudes, values), but also to increase the states to put the person on a road, directing them to certain targets. Given that institutional education is limited in time, it lasted - usually - more than two decades, it will open just appetites, routes, behavior and so on, they being completed is a perspective still bare, even improbable. Education, by definition, is obviously boosted and „virtualizes”. She pushes current into the virtual, the only sequential and progressive to achieve. Multiply lines open and distance learning, including a new cyber-culture referential learning, attracting Internet as a source and means teaching multiplication in real time the links between computer-mediated education partners, reporting to cyber-space as privileged environment, IT education in general are examples of evolution listed.

It does not mean that everything in education moves from virtual to actual. Without a necessary precise and update cannot be talking about virtualization. Something cannot emerge from nothing. Add virtual naturally in conduct which were made by traditional educational programs. [2]

What fundamental changes in new guises of education is the relationship to knowledge. This is not a given entity, final, static, fixed, safe, unique, but becomes a reality permeable, open, and fugitive, dilemma, plural. Hence change in the perception and understanding of it. Relationship with cyber-culture is interactive, summative complete. Consumer information becomes generator, its trustee and manager. „Cyber-space” provides tools for building cooperative groups to a common context many geographically dispersed.

Main features of virtual education, expressed succinctly by the following:

1. *Extension opportunities for achieving virtual education.* More and more educational bodies, aimed at initial, basic or continuous form their complementary structures, adjuvant or independent who enroll in the virtual sphere [3].
2. *Conversion networks and information and communication technologies for educational bodies.* Even from the beginning, these devices have explicit educational features, designed and managed to maximize formative dimensions. He was born an industry specialized devices, software, digital structures for this purpose
3. *Inventing and promoting new pedagogical objects that support or are delivered through virtual education network.* These objects have a high degree of transferability, becoming operational in different cultural circumstances and converting multiple curriculum content.
4. *Formation of a new pedagogical culture of support and counseling form virtual networks online.* Fan procedural and methodological, pedagogical nature is scaled according to the new realities.
5. *Development, testing and implementation of new organizational models and management of learning under the impact of new technologies.* Organizational structures are renovated or replaced with new bodies or institutions profiled delivered virtual knowledge management.
6. *Ensuring quality control by releasing clear formulas accreditation, monitoring and validation of virtual training pathways.* Quality is a dimension that cannot be neglected. Legislative norms, ethics, teaching axiological formulas come to orient new educational achievement. [1]

Via computer and virtual networks, each principle may come into contact with other people, with other modes of thought and sight of things. The principles establishing of permanent open network information flow universalization collateral system without danger of totalitarianism meaning. Each newcomer, with its contribution conceptual, heterogeneity increases saving ideational system risk closure. Information system is additive, cumulative, multifaceted, and self-corrective dilated. Each additional connection adds new; open other interpretative keys, regenerates collective intelligence. Brought chuck Internet does not generate unique, dictated ideas. And, in any case, it does not lead to ideological manipulation or social

totalitarianism (unless the „navigators” have predispositions to that!). One aspect of virtualization education is given and the status of education in the whole band. If conventional devices reserve a weak autonomy, almost everything is planned and educators Directive (what to learn, how to learn, where to learn, what to do after the learning etc.), otherwise things are in the new situation. Powers training and training initiatives are available on line education. They enter the system you want, which location will be addressed and who will remain connected as they want.

The choices are endless, without a criterion without guidance you go there a deeper motivation and sense satisfaction which information. You are looking for information and it is not you! You choose where concerns mentor and leisure. Transmission of information is not only from a particular center (the teacher), but also vice versa, and between „teammates”. Living in your part the contribution system that best you do. Become active factor information to others. Two specific skills presented in this format. Virtual character education leads to a decentralization of many information and knowledge bases. That is why education is made by unlimited access to various educational resources fairly dispersed, left to the PPG. Apart from domestic sources, the school education can connect to alternative sources, its widespread cultural area; they will seize and reassemble the logic of self-interest or dictated by the space you attend formal priority. This situation leads to a new personal time management and institutional to individual rate priority to the collective. [1]

Virtual character education is given and the location and territoriality framework for training. It gives increasingly more physical meeting actors in classrooms at schools in their traditional meaning. Learning groups are also virtual random ephemeral. You can do a school (virtual!) and get a degree (real!) without you seen the way teachers or peers. They can be located spatially at the other edge of the world. Experiences worn by players themselves become an important asset wealth and learning. Learn what (and who) does not think about thinking.

3 Problem Solution

Replacing the real life issues to the media components, computer media can be called virtualization. In education, this phenomenon occurs when computers are used to replace previous learning experiences that were made in contact with the teacher, or to give a chance to learn what in the

past would not have been available at everyone's fingertips. [4]

Since computers have become common in schools with more than twenty years ago, we began learning experiences become accessible actor's learners. These include, but are not limited to simulations, websites and educational packages on the website.

In some countries like USA and Canada but in Europe there are already virtual schools where students do not fall, physically, in a real school, with walls and banks. As web users become more demanding school, are invented and added more and more methods (tools) for use and new opportunities.

Virtualization process includes several components, and object subjective aspects, to the relational or procedural. Virtualization brings about more bodies:

a) Actors:

- education take as individuals that can benefit from remote virtual resources through regular registration, temporary or exceptional various training routes
- learning different groups depending on various reasons: focus groups, joint projects, open or closed groups ;
- trainers, especially teachers or resource suppliers, not necessarily formally recognized teachers;
- different groups of resource persons or groups pedagogical beyond the perimeter of the school (engineering studies, experts etc.).
- tutors, peer learning and other contributors who supervises internships, projects, specific activities;
- community groups or mixed (composed of educators, teachers, tutors...) permanent or temporary opening or closing, formed around specific projects.

b) As contents, programs, disciplines:

- traditional teaching virtualized elements at different levels: lessons, learning units, lessons chains;
- pedagogical media: case studies, bibliographies support, reference texts, projects;
- training, individual or designed for a target audience;
- peripheral content, adjacent, complementary or optional that education can relate

c) Procedures and assessment tools:

- formative assessment tools that provides stimulating learning progression (exercises, tests, quizzes, reflection activities or specific questions);

- summative assessment tools (virtual examinations, essays, portfolios, etc.).
- assessing student knowledge in line with the student or in groups, forums etc.

d) Logistical support and educational resources:

- computer and office resources (software, programs);
- various computer media (CDs, DVDs, flash drives, hard drives);
- documentation and libraries;
- logistics tools for projects or internships.

e) Management procedures regarding training:

- candidate selection procedures: tests, portfolios;
- how to apply proper;
- management fee payments and access to redundant sources;
- management evaluation, assessment, certification.

f) Of school:

- dynamic virtual campus;
- useful information: scholarships, accommodation, transport,
- housing options, entertainment, etc.

Let us not forget that this process of virtualization continues to transformation, new aspects may emerge and make the contemporary educational processes, both formal and the optional or incidental. In the near future, in terms of information technologies are changing very fast in what is now only imagined.

3.1. Virtual Community

Modern communication techniques and situations but leads to a rethinking of what is community at a time. Existing community will be affected, certainly, the way we go about each other. Defined once and a constant space-time line, a fairly accurate identification of geographically and chronologically, current community, along with relocation and eleven days to the new information technologies [5], the permanent recomposed by playing interference and coupling of all kinds. It becomes increasingly wider, more flexible, and more fluid. What remain constant are the commitment actors composing a set of values, identity and recognition of common interests. Talk about EU environmental specialists in engineering astrophysics, intercultural education or alternative medicine, mushroom growers, collectors of stickers or those who believe in fairies etc. from an unrestricted area, and that's because those people are attracted to certain values, online relations constant hard through written text or permanent exchange of

new experiences, incitement products. Information communication space is dilated extensively. He is not fixed within a given territory or a predetermined time interval. Community extends far they reach and information. A community is only as "big" as is "informed", able to communicate across time and space. The virtual community understands that group of people inter-relate to each other through information and communication systems and that exchange-value symbolic in some areas of interest that they, they build and maintain such membership. This type of community is defined by cooperation and regular exchange of information.

Virtual community of individuals is generated and becomes dependent on technical network performance. Without the infrastructure of this type cannot occur or operate a virtual community. Degree of virtualization is conditioned by the degree of technical formulation. A community is virtual since its members use computer network to determine interactions on line training, education, interests, and hobbies etc.

Structuring computer-assisted community implies a redefinition of collective intelligence, becoming more dynamic and connected to democratic interactivity requirements. We have a more flexible reality, which is distributed everywhere, remaining open to new inducements, and entered synergistically activated continuously in real time. Add virtual community naturally over the real one, making it, prolonging and complicating it new virtual recover something of real space notes, but adds something extra. Anyone able to establish connectivity synchronous or asynchronous hides the mysterious germ solidarity.

3.2. Determination of open distance education technology

Openness of education is given free access to a range of educational services and resources to the learner formative character without any restrictions like: entrance lock or strong selection, rigorous work rate prescribed constraints on the advancement of learning, respect for individual wishes of a foreign legal system. Principle guarantees an individual journey, depending on interests, opportunities and desires. Eases insertion opening is given by trainees in a training system for accessibility in an instructive principle, the democratic nature of the inputs and outputs of the system.

Traditional education systems are characterized by this feature. Opening is maximized by coupling the express stipulation of the principle facets of

distance training by providing education right to interact with educational institution without leaving their usual location. Conceived as a new formula to achieve initial or continuous training, distance open education paradigm involves a clarification of democratization of education in contemporary technological conditions. Open and distance education is a form of achieving established based education training slim device, enabling the individual constraints of space, time and resources. Is a formula, socially established and recognized, generated by the impact of new technologies on educational field. It facilitates individualized and differentiated learning through personalized connection between individual skills and learning sources. At the same time, this offer is based on and develops educational autonomy of the person, passing it a whole series of powers of traditional teaching (line initiatives, election, and evaluation), and control by an external trainer decreasing or even disappearing. First of all, learning leads to a reduction in contact between teachers and students, the educational institution and its main beneficiaries - education. Students will become quite independent, using structured teaching materials specifically for this purpose: written media, CDs, video and audio disks. In form, will be generating new forms of learning: tutoring, discussion forums, situation simulation exercises on their own, study, etc. At the same time, this form of delivery of education meets the requirement of individualization and personalization formative paths. It assumes that an education program is successful when concrete will target individuals with well-defined necessities and possibilities. At the same time, he addresses the adult population, those who wish to increase their training, to attend a retraining course, giving everyone the opportunity to be permanently integrated in a process of re-training instructive and very professional. Call for new technology is a shining example of input and fitness techniques into the traditional pedagogy.

Traditional educational media are not abolished, but are combined with new technical media. Technical innovation „absorbed” in a specific pedagogical tools classic, graceful it into line with the new requirements. It speaks more often of distance learning devices, media devices, knowledge engineers training. The term has a connotation educational device composite is not only understood strictly object. Device „means an organization serving a strategy”, a targeted action aimed at achieving planned results, a device is a court, a place of social interaction and cooperation

possessing intentions, functions and methods of their interactions.

3.3. Professionalization of environmental engineers

Currently, the new requirements of environmental engineers are given professionalization that information and communication technologies - especially computer - will become universal utility tools leading to the development of a new way of thinking and behavior that will enable them to meet these new requirements. [4]

Each educator will have to get a basic training in involving a number of objectives such as:

- acquire common principles governing the application of information, knowledge of nature, properties and information structures;
- develop an overview of the extent and importance of computer applications and their social and economic effects on the individual and the community;
- building capacity to identify situations in whom the use of informatics and design appropriate solutions, with specific curricular strategies;
- skill development to implement new technologies and search activities as storing information, processing it for communication, monitoring and control them;
- knowledge of current means of communication with computer equipment;
- establishing cooperative relationships with collective profile of other countries;
- extracting date information on global information networks, etc.

Introduction of new information technologies in education systems requires change of focus in terms of priorities and resource allocation purposes. It reconfigures new priorities such as that of learning to learn and to use this power entire life, so learning to experiment, to correct and solve problems, to learn that to cope with an enormous and diverse information table and prove critical in selecting them, that of learning to live in an environment of change and cooperate with others in making intellectual tasks. Distance learning environment has the main features available resources and means of contact between tutor and student and between students

The advantages of using virtual learning environment through training computer engineers are:

- enabling innovative learning ability, adaptable to conditions of rapid social change,

- strengthening scientific investigation skills
- realization that the concepts learned will find useful later,
- increased yield coherent properties of knowledge by assessing students' immediate responses,
- enhancing student motivation in learning,
- stimulate logical thinking and imagination,
- introducing a cognitive style, efficiency, an independent work style,
- installation overcoming climate, competitiveness,
- mobilization psychomotor skills in computer use,
- development of visual culture,
- useful practical skills training,
- providing a permanent feedback, teacher being able to redesign work according to the previous sequence,
- fast data processing facilities, to perform calculations, display of results, output of graphs, tables,
- provide choice and use appropriate strategies to solve various applications,
- develops thinking so from a general way of solving a problem one student finds the answer to a practical problem,
- prepares students for a society based on the concept of education,
- causes a positive attitude of students towards learning discipline that is used to computer and moral values, cultural and spiritual needs of society,
- helps students with disabilities to integrate into society and in education,

The computer is extremely useful in virtual education as it simulates complex processes and phenomena that no other means teachers cannot make out so well. Thus through his offers students, modeling, justification and illustrations of abstract concepts, illustrations of processes and phenomena observable unobservable or difficult for various reasons.

Experiments allow virtually impossible due to lack of teaching materials, inadequate endowment of university laboratories or the danger to which they were exposed students and teachers.

Students can easily change the conditions in which the virtual experiment, you can repeat a sufficient number of times so that they can watch how to place the phenomena studied can draw own conclusions, may state the law.

3.4. Equipment required for environmental engineers

Virtual reality is used as a way to integrate fundamental concepts of design, analysis, execution, collaboration, interactive learning and testing as required training standard [6]. Use the following equipment and software such modeling soil GIS Laboratory Multipara meter Instruments PCD 6500 Eutech product, measuring pH, measuring conductivity (resistivity, TDS, salinity), measuring dissolved oxygen (DO, BOD, OUR, SOUR), temperature measurement, binocular microscope (NITECH Company), magnifiers binocular, BINDER CO2 incubator CB environment, thermoregulation oven, hygrometer, IT System for Internet connection.

Practical work in practical applications are used original dumps are located on its technological issued, inactive ponds, ash landfills, abandoned quarries and so on, where the student inventoried species / subspecies, types, structure, balance, structural imbalances in ecosystems newly formed environmental factors and anthropogenic - influences specific diversity, quantitative structure, status groups living environment and ecological role in the functioning of aquatic ecosystems hydrobionts. The measurements and sampling determine abiotic and biotic parameters, of aquatic ecosystems. Environmental engineering study program graduates receive a favorable situation in terms of labor market, related on the one hand the general profile of specialization and on the other hand, the deficit of specialists in relation to the need for national and European level in the field. Using virtual education graduates will receive and exchange information with other experts in the field.

4 Conclusion

As a result of those presented in this paper the following conclusions:

- by applying virtual education in teaching is required laboratories and classrooms in which the activities from the technical area disciplines and especially ecology, taking into account the need for permanent connection technologies requirements under a changing;
- to achieve a correlation between objectives, methods and equipment used to be taken as absolutely necessary.

We want to say that the future is being implemented training using virtual reality forwarding disciplines in the curriculum are specialized in environmental engineering.

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