The virtual university: challenge of the third millennium

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Abstract: - Virtual universities have been created a little everywhere in the world. They suppose and adopt a new manner of learning and of teaching, a new educational model and organization. In this paper, we discuss the problematic topic of the virtual university and the significances to give to this new concept. We also provide some key elements of reflection and practical experience to guide the installation and the development of virtual university as a central point of expansion policy of the use of the new media in the high education system.

Key Words: - Virtual university- e-learning, numerical technologies, computerized network, education system, distance training and teaching.

1 Introduction
Since ten years, the planet covers multiple satellite networks devoted to the teaching whose interconnection in progress will constitute soon another world network in complementarity with that of Internet [1-4]. Transcending the constraints of space and time, technologies of the communication reduce the terrestrial sphere to dimensions of a village. They upset the modes of training and teaching, as much as the modes of production and life in society, this inducing a true civilisation change of humanity.
The numerical technologies theoretically conceal educational potentialities without limits, making the objective of teaching more realizable for all, throughout for life, which the society of communication in emergence implies. Arriving at saturation, the traditional systems of teaching and training cannot follow the explosive rhythm of the increasing request of high education at the younger generation. They cannot answer either on the qualitative and quantitative levels the extent and the diversity of the needs for continuous training at the working population. These needs are in the process of generalization under the effect of the scientific and technical progress acceleration, which returns the duration of nullity (more and more of qualifications more short). The new means of communication spread teaching beyond the closed field of the classroom towards all social spaces, decreasing at a marginal cost the best teaching messages and putting them constantly at the range learning and in any place from planet [5]. Becoming accessible for the majority of the countries in the process of development by the continuous fall of their cost, information technologies represent for the systems of these one the single solution to mitigate a crippling deficit their human and material resources in order at the aim of their levelling and the development of their capacity of reception.
The computerized networks are became an obliged ways to reach at the brought up to date knowledge and to transmit this knowledge. The university professors or teachers could not, at the risk of being disqualified, to do without computer and the connection to the international sources of knowledge. The integration of information technologies in the educational systems as well presentials as remotely defines the educational systems challenge of the beginning of this third millennium. The educational challenge is in the contemporary society of knowledge in the heart of all the societies stakes. It is in particular by the effectiveness of its education system to form competitive human resources that a country can conquer its place in a world economy, and based on the immaterial production and exchanges, and the production this ensuring in that way. So, no country can turn the back to the educational revolution in progress without marginalized and be condemned to poverty and the dependence.
The open universities were the first to adopt the new means of communication to reproduce remotely the teaching face-to-face discussion of the amphitheatre thanks to the means of the teleconference and the video transmission as well as be ensuring the services of proximity (distance tutorial) for learners [5]. So, a little everywhere in the world, virtual universities created by transformation of old open universities or by new creations.

The objective of this paper is to discuss the problematic topic of the virtual university and the significances to give to this new concept. Also, We provide some key elements of reflection to guide the installation and the development of virtual university as a central point of expansion policy of the use of the new media in the high education system.

2 Concept of the virtual university

2.1 Problematic of the virtual university
Educative systems including the university are today submitted to new constraints of quantity, of diversity, and of evolution speed of knowledge. The universities overflow and one cannot increase the number of teachers proportionally to the demand. The training demand does not know only a huge quantitative growth; it undergoes also a deep qualitative mutation in the sense of an increasing need of diversification and personalization. The people tolerate less and less the idea of following uniform studies or rigid curriculum that do not correspond to their real needs and to the specificity of their journey of life. In developing countries, there is the cost of the teaching that puts a great problem. Indeed, these countries with weak BIP and under structural adjustment, can no longer hire new teachers for the university. Also, the university has to profit from the mutations, which are imposed by the internationalisation of the evolutions of contents, of methods, and of means. In order to face these constraints, the virtual university constitutes a federator concept that has to allow promoting the university teaching [6, 7].

2.2 - Definition of the virtual university
Before defining the virtual university, it is interesting to define firstly the word "virtual". This word can have at least three meanings:
- A philosophical meaning: is commonly called virtual what exists by power and doesn't exist by act.
- A senses running: the word "virtual" is used for meaning the unreality.
- A technical meaning related to the computer world: the virtual is real.

Within numerical networks, the information is physically situated somewhere on a given prop, but it's also virtually available at each point of the network where it's asked.

The virtual university has no walls, no specific place and no physical identity. It is accessible in an open system as the Web by teachers and students from various horizons. It is therefore a scientific space, whose teachers and students are not localized in a same place and who's the temporal rhythms can be different [7]. It rests on 4 pillars:
- The circulation of the works and their implementation.
- The distance teaching and the self-training.
- The media and the virtual libraries.
- The services to students "virtual campus".

Schematically, we can represent the virtual university as indicated in the Fig.1.

2.3 Objectives of the virtual university
The virtual university has as main objectives:
- To use the advanced technological wherever may be the location of the source and of the target.
- To conceive new activities.
- To make available the product of distance teaching.
- To conceive a media library in a virtual space of information that allows access to all the necessary points.
- To offer to students the services for their orientation in the framework of a virtual campus.

Being materialised by several virtual campus, around innovative products, the virtual university has therefore to be considered as a network of true centres of intermediation. The excellence will have to irrigate the remote centres.

This great and very important network of centres of intermediation is therefore put at the disposal of the teacher as well as a very large hearing, various sources of knowledge and an assistance of experts others horizons. The whole is going to have to allow supporting his teaching task by using efficient technological means [8]. As for students, they will have the advantage of a suitable teaching, a pleasant and convivial environment and a self-appraisal of their knowledge.
2.4 Accessibility to the virtual university
To access to a virtual university, the students must firstly enter in the web site of this university and register on line by filling the registration form available there. In this form, they must put some of their personal data such as their name, their origin, their level and their electronic address (e-mail). Other information could be also requested. In return, if their registration is validated, they receive on line a password, which allows them the access to all of the functions and services of the university, to the historic of their consultations and to the results of their appraisal. Regarding the teachers, they are recruited in a valid and homogeneous group. This group could be limited or extent (French-speakers, African, Mediterranean,...). They are indexed on a directory allowing joining them by phone, by fax or by e-mail. Their specialities are indicated by key words, what allows searching them according to their competence.

2.5 Organization of teaching in the virtual university
In the virtual university, one attends to a new style of pedagogy favouring at the same time the personalized apprenticeships and the cooperative apprenticeship. Students have the possibility of surfing on the ocean of inquiry and knowledge accessible by Internet (programs can be followed on the Web). The electronic conferences and mails are useful to the intelligent tutoring and also to the system of cooperative apprenticeship. Systems of simulation allow the students to familiarize with the practice of complex phenomena (Fig.2).

The teacher in this situation has a new function. He becomes an organizer of the collective intelligence in its group of students rather than a direct knowledge dispenser. Indeed, his new function consists to inciting the students to the knowledge exchange, to insure them the personalized piloting of the apprenticeship circuits, to advise them how to find the information and how to select it.

2.6 Advantages and disadvantages of the virtual university
2.6.1 Advantages
According to available means, the virtual university could bring the support to traditional universities by:
- Educative infrastructures from a distance
- The advice and assistance
- Shared pedagogical contents of various horizons
- Human and technical means facilitating the improvement of the pedagogical contents

She has no infrastructures. What allows a total displacements absence and an important number of students and teachers. Moreover, she transcends the borders and associates universities that can know different development levels [9].

2.6.2 Disadvantages
Among the disadvantages of the virtual university, one can quote the absence of human contacts, the application of systems of appraisal without surveillance and the adoption of a system of self-appraisal in the frame of a continuous training instead of a system of validating examination.

3 Virtual educational components
We divide the needs of virtual university courses into four main components [1]: presentation, activities, communication, and administration.

Presentation comprises all functions related to the delivery of new material. It is one core of education. In traditional, face to face residential, education (we will call this human based education or HBE) presentation is achieved through lectures, textbooks, and video.

Activities comprise the learning materials, active and interactive, which involve students in doing something. In most web based education (WBE) systems activities are assessment oriented; i.e., their goal is assessment of student progress (it includes self-assessment). Assessment, provided in HBE through quizzes, tests and homework, is important in credit-bearing courses and critical in education that diagnoses the state student knowledge and then prescribes ways to move the student to a higher state. A number of WBE systems can also offer activities specially developed to support learning-by-doing. These systems are more concerned with providing student support and are similar to HBE labs.

Communication comprises all ways of communicating (group or one-to-one) between teacher and students, or between student groups. The university student who has problems is able to ask questions of a teacher or of peers. Communication is an important way that teachers and students diagnose and remedy problems. This is done with problem solving feedback, additional explanations and
suggestions of additional work. Communication between students is so important it is often taught as a separate skill. In HBE communication is achieved in contact during classroom activities, office hours and informally.

**Administration** comprises all record keeping activities of registering students, payments, course cancellations, course credits and grades, auditing student progress against degree requirements etc. Teachers and administrative personnel perform administration in HBE. While at first it may seem that tasks such as recording payments and student withdrawals are not really a part of education, they most certainly are a part of what allows universities to operate. Without administration, university education would not take place.

Multiple tools and systems have been developed to provide all four components in virtual universities (Table 1). Within each component these tools and systems could be further divided into two groups-tools used in course preparation (various authoring and set up tools), and tools used to support a running course (delivery and run-time management tools) [1].

### 4 Virtual university experience

In this part of the paper, we give a brief description of an American experience [10, 11] to provide the lecture with a good example of achievement and practical situations in which the concept of virtual university has been applied and works well. It concerns the Virtual University (VU), which is the oldest online learning community on the World Wide Web. More than one million people from 128 countries have attended classes at its global village campus. VU was one of the first 500 sites built on the Web, but has been hosting online courses since the first modern bulletin boards surfaced in 1980. VU is widely regarded as a pioneer in online education; many of the innovations that have been developed over the past decade are now widely used at other e-learning communities. Its mission is "Empowerment Through Knowledge".

People of all ages and from all cultures and walks of life are welcome at VU. To become a member of this virtual community and receive a free e-mail newsletter and course calendars, the student has just to fill out the subscription request available online in the Web site of the UV. When subscribed, a personalized e-desk will be instantly created for the subscriber. From this e-desk, he can enrol for the virtual classes, visit classrooms, participate in public bulletin boards, and access various other tools and resources with an easy navigation tips and mouse clicks.

#### 4.1 Enrolment for virtual classes

To enrol for virtual classes, one must firstly have a VU e-desk and must be logged in. Once the e-desk opened, he may use the links to view the current calendar and course descriptions. Then, he has to sign-up for virtual classes. The enrolment request is processed instantly and the virtual classes appear on the e-desk. Once he has enrolled for classes, he can add or drop a class quickly and easily.

Virtual University is a member-supported global learning community. There is a simple registration fee per term and students can take up to three classes concurrently. There are no "per class" tuition fees, and most courses do not require textbooks. Registration fees can be billed to the international credit card. Mailing a check or money order can also pay them.

#### 4.2 Courses prerequisites and participation in class

Most courses at VU are "open enrolment" and anyone can attend. A few courses have prerequisites, which must be satisfied before the student enrols. Prerequisites, if any, are listed in the course description on the calendar for the current term. Most VU courses do not require textbooks. If a course requires a textbook, it will be stated in the course description. Textbooks may be purchased at the Campus Bookstore by clicking on the book title in the course description.

To participate in classes, the student doesn't have to be online at any particular time to attend the virtual classes at VU. He can study and does homework at his leisure. In most classes, lessons are posted once a week and are including a tutorial, suggested readings, a discussion topic, and homework. Lessons are usually posted Sunday night but this may vary depending on network traffic, staffing, power outages due to inclemently weather, and other considerations. Classes end officially on the final exam due. Course materials, including discussion board messages, will remain on the e-desk throughout the term and for one additional week beyond the exam due date. If one wants to save a copy of course materials for his own personal use and future reference, he must copy the material to his hard drive before the end of the term.
4.3 Classroom discussion boards and homework assignments
Class discussion is an important ingredient in the recipe for online learning at VU. Each classroom has its own discussion board. Participation in class discussion allows to share ideas, resources and feedback with classmates which can enhance the online experience and broaden the knowledge. Because many Internet users are concerned about privacy, the real name or the email address could not appear in messages on class discussion boards unless the user choose to reveal it.

In some classes, homework may be assigned. These learning challenges are optional and meant to give a better understanding of the curriculum. Homework typically involves additional reading or research using resources freely accessible via the Internet. Such projects encourage students to delve beyond the material presented in weekly lessons and provide opportunities for hands-on learning. To derive maximum benefit from a course, the student should participate in homework challenges to the best of his ability. Homework papers should be posted on the class discussion board unless an instructor directs otherwise. Homework is due by 11:00 p.m. (Pacific/Campus Time), Saturday of the current week. If the student is unable to complete a homework assignment on time, he simply goes on to the next lesson. As a general rule, homework tasks are self-evaluated and usually will not be graded or critiqued by instructors.

4.4 Extra Credit Projects
The student can maximize his learning experience at VU by completing an Extra Credit Project for his course. Most courses give him this option. However, a few classes do not. Extra Credit Projects are assigned at the start of week 5. Some instructors provide a list of suggested topics, while in other classes the student can choose his own project. For instance, he might design a Web page, write an essay, or set some other learning goal.

4.5 Final exams
Every course at VU has a final exam. Exams are posted in the student's classroom at the start of week 5. Exams must be completed no later than 11:00 p.m. (Pacific/Campus Time) on Saturday of week 5. In fairness to students who complete their exams on time, no extensions or makeup exams will be allowed.

In most courses, the final exam consists of randomly selected multiple-choice questions. Thus, no two exams will ever be the same. Each correct answer is worth an equal number of points. No points are deducted for wrong answers.

When the student finishes taking his exam, he clicks the Submit button at the form. Then his exam will be scored instantly and he will be able to view the test questions and correct answers. If he would like to save a hard copy of his test, he must print the page while he is viewing it because once he leaves the page, he won't be able to return and view his test results.

Exam scores and grades are not official until verified and recorded by the registrar. If the student is taking a final exam for personal enjoyment and he doesn't want his grade to be recorded, no action is required. However, if he wants his grade to be recorded in his official transcript, he must submit a formal request. The registrar charges an extra fee per course for grade verification and recording. Remittances can be paid by credit card or land mailed.

4.6 Grading policies and Continuing Education Units
The highest possible score that one can earn on a final exam is 100 points. If the score is less than 100, extra credit points that one has earned, if any, will be added to the test score, up to a maximum of 100 points and subject to the conditions mentioned above. Exam scores below 70 and Incompletes have no grade value and are not recorded.

In the event that the student is dissatisfied with his grade in a course, he may repeat the class at his convenience. When re-enrolling, he will need to pay the usual registration fee for the current term. If he earns a higher grade, he can have the lower grade that he earned previously purged from his transcript (he must contact the registrar and request that the lower grade be removed). If he receives a lower grade, the higher mark that he earned previously will remain.

An exam score of 70 or higher (including extra credit points) is a passing grade and entitles the student to earn Continuing Education Units for a course. CEUs are a globally recognized unit of measure for recording participation in continuing education activities. One CEU represents ten hours of participation in an organized learning experience. The student can earn two CEU credits for most five-week courses at VU.

CEUs may be used for developing or documenting new job skills, wage upgrades and
promotions, re-certification, community service training, and personal development. CEUs cannot be applied toward college credit or an academic degree. However, some universities accept CEUs as evidence of learning outside the classroom and may grant college credit for non-traditional credits in the student’s portfolio.

There is a list of schools, colleges, corporations and other organizations that recognize CEUs from VU for job training, wage upgrades and other continuing education purposes.

To earn CEUs for a course, the student grade must be verified and recorded by the registrar. CEUs are issued automatically when a grade is recorded and will be reflected in the student’s transcript. VU will maintain a permanent record of transcript grades and CEUs of students.

4.7 The e-transcript
VU offers a state-of-the-art system of electronic transcripts. The student can view an official record of his grades and CEUs in his browser. His e-transcript eliminates the need for manual processing as well as printing and mailing of paper transcripts. His e-transcript will display a list of courses that he has taken at VU, along with his final exam score, letter grade, grade point value, and CEUs earned for each course that he has asked to verify and record. In addition, his transcript provides a short summary of each course. These course descriptions may be used to compile a portfolio of life experience credits, assist an employer in evaluating promotions or wage upgrades, and for other continuing education purposes.

5 Conclusion
In the framework of its pedagogical mission the potential university has always coordinated, to see conceived and animated a system of teaching centred on the autonomy of apprenticeship. This characteristic leads us to reflect on the appropriateness in the installation and setting of tools that will entail the development of a new pedagogical, evolving and valorising approaches. This new approaches has to allow to benefit from a teaching of experts, a convivial and attractive environment, a teaching of proximity and a self-evaluation of the knowledge.

Today, the idea that remains is that of the distribution of great quantity of knowledge by many various canals. Also, the opposition of new computer equipments, telecommunications, and the production of new software are evidently the key factors for the development of the distance learning through the virtual university, because for a long time the isolation, the lack of communication, specialists, equipment, laboratories, problems of displacement are and still the essential problematical of the distance learning and teaching.

At this state of fact, the totality of the new technologies of information and communication in service of the distance learning seems to be the best means of the technological advancement the most relevant. Indeed, these tools, once used for contributing, will allow communicating more easily, more rapidly and more efficiently with teachers and with or between students. Their utilization and their mastery should be a real progress on the way of the success.

References:
Table 1. Groups of tools required to preparing and running a virtual university course.

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<td>Support tools</td>
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Figure 1. Schematic representation of the process of functioning of the virtual university.

Figure 2. Organization of the teaching within the virtual university.
Professor Abdelfattah BARHDADI, from the Ecole Normale Supérieure of Rabat, Morocco, works in the field of semiconductors and their modern applications in the new technologies of photovoltaic conversion. In 1982, he received his undergraduate degree in physics from the university of Mohammed V, Rabat, Morocco. After, in 1985, he received his PhD degree in the field of semiconductors and solar energy conversion, from the university Louis Pasteur of Strasbourg, France. He had been working as an assistant professor from 1985 to 1991. After, he received the highest degree of Doctor in Physics Science (Doctorat d'Etat Es-Sciences) from the university of Mohammed V, Rabat, Morocco. Now, he is full professor at the physical department of the Ecole Normale Supérieure, Rabat, Morocco, since 1995. He is also permanent researcher and responsible of the scientific projects in the laboratory of semiconductors physic and solar energy. He is the coordinator of the Pedagogical Action Group and a founder member of the Interdisciplinary Group of the Experiments Assisted by Computer. He is also a Senior Associate of Abdus Salam International Centre for Theoretical Physics (ICTP) and an active member in many other scientific and pedagogical international organizations, commissions and structures.