

On-line Education, Web- and Virtual-Classes in an Urban University : A Preliminary Overview.  
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**Introduction and origins:** On-line education, Virtual-classes and Web-based education, are fast becoming the norm of the day in many educational institutions across the USA and elsewhere. They are not new to educational innovations. A recent visit to an Australian school in Alice Springs, Northern Territory, Australia [1] was quite revealing in the origins of such an education and its methodology and prompted the current research interest.

Alternative technological methods of teaching and learning (1850 to 1950), such as distance-learning, using telegraph and radio, and correspondence courses through the mail, have been known for almost two centuries. After World War II their use increased considerably in the UK, Australia and USA. Increased number of students in the 80s looking to acquire degrees and technological advancements (Internet revolution) have resulted in a wide range of educational offerings. The detailed time-line of the development of this subject and its history are dealt with in a Web site of Open University [2]. Old Dominion University in Virginia [3] was a national leader in technology-administered distance learning through TELETECHNET. A current list of universities and organizations offering Web-based courses is given in [4]. Francek and LeBlanc [5] list the best Earth Science Web Sites and also explained some assessment criteria.

'Learning for the 21st Century', a report by Sir Ron Dearing in 1997 [6] is an important step in Web-based education. Dearing's committee, charged with an enquiry into higher education in UK, formulated 93 recommendations, of which 15 related to 'Computers and Information Technology'. It asserted that "all students will have access to a networked PC by 2000/2001 and all students will own their own PC by 2005/2006". The report also stated: "While traditional, but still-relevant values must be safeguarded, higher education will need to continue to adapt to the needs of a rapidly changing world and to new challenges. Increasing competition, particularly in the context of lifelong learning, will come from employers and training providers, in partnerships with major institutions of higher education possibly linked to the entertainment and communications industries, and from prestigious institutions overseas making extensive use of distance learning through modern technology."

**The reason and general philosophy behind 'On-line' education:** While the original intent of this new

method is clear, the present day context in which the schools and universities are developing the new and novel methods is somewhat different. Following the publication of the Dearing Report [6], it is clear that the continued expansion of student numbers and the increase in part-time students and students from non-traditional backgrounds is likely to lead to further development of student-centered and resource based learning methodologies. It has become fashionable to have 'On-line courses', and the computer savvy faculties are eager to teach while the students are flocking to these courses. The universities and organizations who offer the courses, the faculties who create these offerings and the students who wish to enroll, all have different reasons, each of their own, for making these courses popular and needed.

**Opportunity and need for 'On-line' education (Internet courses):** Brooklyn College, City University of New York, an Urban University (with no dorm facilities) offering liberal arts education is ideally suitable for experimenting with the new methods of education because of the large number of students involved and the diversity of student groups that attend the college. There are many departments that offer 'On-line' courses and the geology department teaches a one-semester general geology course for non-science majors. Among many sections of this course we offer every semester, there is one that is Web-based. I hear many kinds of reasons as to why the students want to enroll in the web section. Some of the reasons I have heard from students who want to enroll in the section are: *'I cannot come to school on any other day'*, *'the class schedule at the college does not fit my work schedule'*, *'I live out of town now and I cannot come to the campus to take courses'*, *'I need this course to complete my degree requirements'*, *'I can work at my own pace'*, *'I do not have to be bothered to get up early or be around late to attend scheduled classes'* and many others similar to these. Course content and instructor's reputation aside, the Web section of geology has become very popular and gets filled on a priority basis. In a 2003 New York Times magazine section article "School away from School" [7] Emily White makes a case for the virtual school for the 'outcaste and oddballs' of high school students. While interviewing Ms. Mary Jean Sandall, principal of the Salem-Keizer School (a well known virtual school), she quotes "This (the virtual school) is a 21<sup>st</sup>-century model of learning". The common thread for

the virtual school kinds seems to be: “that they escaped something dangerous by getting out of high school”. In short the student was getting away from the real world that is challenging.

**The Educator’s point of view:** The educators (teachers or professors) who subscribe to the web-based education have similar viewpoints as the students. They do not have to stick to a schedule, can work from home at their own pace etc.. In addition some faculty feel that they are pioneers in a new type of educational tool and assure themselves that they are doing research in educational skills. Colleges and other educational institutions encourage such activities, under the rubric of research or by offering incentives to the faculty. The rewards are quite satisfactory. The University administrators are pleased with the success of these programs that are popular with the students.

**Some problems in teaching Laboratory –based science courses through the Internet:** Science courses traditionally contain a lecture and a lab. The lecture part presents little problem to the motivated student. They can read, understand and ask questions via e-mail and get explanations. The lab part is a whole different story. The traditional laboratory is always designed with hands on experimentation and observations, inference, setting up of a hypothesis, checking it and rechecking it and finally arriving at a conclusion and a viable theory. While many parts of the procedure could be done on the computer quite easily, the actual experimental part presents a serious problem. Conducting experiments in cyber space or on the Internet is a tough proposition and new and innovative methods need to be designed. Some progress in this direction has been made in several courses and the results await approval from students and faculty. In the case of geology, field work and observation are important even at the elementary level and the student is deprived of the pleasure of holding a rock, mineral or fossil in his/her hands for observation and study. Any amount of computerization in 2D, 3D, color, or video footage cannot match the actual inspection and observation. Experiments in other sciences also have the same problems.

**Some critical assessment from faculty and students:** There is considerable acceptance of the Web-courses for the sake of convenience. All parties are fully aware of the pitfalls of this type of “sight unseen” type of approach. In a survey that was conducted at Brooklyn College, there was some serious criticism from at least some of the students, specifically about the laboratory part of it. While many students were fascinated by the on-line experience with no scheduled class to attend, they did have some negative comments about the whole

experience. They said that they missed the classroom atmosphere where there is a give and take between the teacher and the student in an open class setting that cannot be simulated on a computer screen. Some students commented that they were deprived of a real education that they paid for and instead were sitting in front a computer and wondering what to do! Lack of a field trip was a major item of concern for the students who were looking forward to an out-door activity. The instant gratification of a question answer session in an open classroom setting is the biggest draw back. Some faculties felt that the Web material can serve as a supplement to courses. Most textbooks come with CD ROMs that have a wealth of information. Additional supplementary reading material, test banks and the like are very useful to the student, and all of these can be handled well with Web-based instruction.

**What the future holds for the newly developing teaching technology:** For now, it is clear that the Web-courses are quite popular and the trend is expected to continue. Laboratory science suffers most. There are a number of items that need to be evaluated about this new method of instruction before they are accepted as the norm. *Is an education without a face-to-face contact between the teacher and the student in a classroom setting appropriate at all levels? Are Web courses suitable for college education and can they handle all aspects of college education? Can laboratory courses be taught effectively using the Web? Are there any alternative methods that could be used to attain the same results? Will there be sustained student acceptance of Web courses at all levels? Can Web materials be used as supplementary to class lectures and lab demonstrations? With the increase of Web courses, what will happen to Universities? How good is our evaluation technique at the present time?* Only time and further research will be able to give us reasonable answers to these questions.

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**References:** [1] <http://www.assoa.nt.edu.au/> [2] <http://www-e.openu.ac.il/> [3] <http://www.dl.odu.edu/> [4] [http://dmoz.org/Reference/Education/Distance\\_Learning/Online\\_Teaching\\_and\\_Learning](http://dmoz.org/Reference/Education/Distance_Learning/Online_Teaching_and_Learning) [5] M. Francek and C. LeBlanc, 2003, J. Geol. Sci. Ed. v51, No.4 [6] Sir Ron Dearing, 1997, “Learning for the 21st Century”, Report [7] Emily White, 2003, “School away from School”, New York Times magazine section article