Presentation 2[1]

Assessing the Effects of Computers on the Teaching-Learning Process

Dr. José Alejandro Ramírez
Chairman, Department of Educational Sciences, Universidad de las Américas, Puebla
México

Abstract.

Recently, in México, politicians, teachers and parents seem to agree that for the new generations to keep up on technology, it is necessary to have computers and Internet in schools at all levels. It is argued that given that we already are living in the "knowledge society", students have in computers and Internet "a world of information" for better learning. Likewise teachers have in computers the ideal equipment to revolutionize their teaching methods. This report of a Case Study in a private Mexican university shows that the use of computers and Internet in the teaching-learning process is still far away from becoming a reality. And more important, the expectations for computers and Internet to revolutionize the teaching-learning process might not become true unless a more broad strategy to ensure their use by teachers and students is implemented.

Key Terms: Information Technologies in Education, Higher Education and Computers, E-Learning.

Introduction.

This paper is organized as follows: First, some characteristics of the socioeconomic context of the research project are given in order to understand its purpose. Second, some findings of previous studies are presented. Third, the methodology and some results of this project are described; finally, preliminary conclusions are discussed.

The Socio-Economic Context.

In Mexico, for the last 10 years, at least, a strange coalition of politicians, parents and teachers have been demanding access to computers in schools. The idea is that most of the schools from

[1] This is the paper based on the presentation at the conference

elementary to higher education should have computers for teachers and students to use. Of course, the arguments to have computers in schools vary in relation to the groups. For example, politicians believe that given that computers have been successful in improving the efficiency in business then computers should also improve the efficiency in schools. Even those politicians committed to social justice see computers as the ideal instruments to provide education for all, especially for poor in rural areas.
Parents, of course, do not want their children to be out of the trend of the information revolution. They see that the labor market has increasing demands of people with computer skills and obviously, they want computers in schools so their children learn how to use them.

As for teachers, many of them believe that computers will revolutionize the pedagogical process; the availability of information on all kind of subjects via Internet, the electronic mail, the possibility of designing multimedia presentations, among other computer capabilities, have created the impression that "the teachers dream" is becoming a reality. Finally, computer vendors have been very pleased, of course, with this trend. They have broadly supported this demand with aggressive marketing strategies to the extent that one wonders to what extent they have created the demand for computers in schools. For example, a few years ago, in the university included in this report, computer vendors offered 500 computers "for free", as long as the university bought servers and browsers. That offer could not be rejected, of course, and the trend of buying computers started with no end on sight. Nowadays, professors and students "cannot live without a computer".

In other words, if the trend to provide schools with computers is important in the lower levels of education, it is not surprising to observe that higher institutions in Mexico are leading the school system. In effect, it would be safe to say that universities in México, public and private, have an increasing number of computers for teachers and students to use.

With all the rush to equip schools with computers in the country many absurd situations have occurred. For example, poor schools in the countryside that only have a very old blackboard, few chairs for students and many of them without electricity, suddenly, they have a couple of computers "to improve" the teaching-learning process. In many other schools, computers have been provided but not installed because neither teachers nor students know how to use them. Or in some rural areas, teachers are afraid of using the computers because if they are broken or stolen the teachers would be responsible, as a result, they prefer to keep the computers in their boxes or taken them home.

But beyond these absurd situations, the most important question addressed in this paper is whether or not access to computers in schools is enough to guarantee their use for

pedagogical purposes. In the next section, some results of previous studies are described.

Results of Previous Studies.

To certain extent, it is surprising to observe that the Mexican Government has been investing large amounts of money to provide computers in schools with the hope of improving the teaching learning process and very few research projects to evaluate the results have been undertaken. It seems like the government is taken for granted that access to computers is all schools need to start revolutionizing the teaching-learning process. But to what extent, this assumption is true? Are teachers and students using computers for teaching and learning purposes? A research project in elementary and secondary schools carried out several years ago showed some disappointing results.

In effect, in the year 2001, the author participated in a government project to design an Internet Program for Mathematics and Spanish at Elementary and Secondary level in the State of Puebla. In the diagnosis stage of the project, 40 schools were visited in urban areas and all of them had, in effect, the so called "Computers Centers"; some of them built ex profeso and in some others schools, the Centers were improvised in storage rooms. Each Computer Center had about 10 to 20 computers, half of them with Internet connection. In the Elementary Schools children from third to sixth grade had a "computer class" of about one hour, twice a week. In Secondary Schools the computer class was also twice a week for the three grades. In both kinds of schools there were two to five children working in each computer, most of them learning to use a processing Word software. Although it is also true that some of the children were using Internet, either because the instructor taught them or more likely, because children themselves learnt how to do it, the use of Internet was mainly for entertainment rather than for pedagogical purposes. In other words, children were more interested in Internet for the games than for looking information on specific topics.

But more disturbing was to find that most of the teachers in Elementary and Secondary schools were quite indifferent to the computer classes. In other words, the computer class was only another class in the curriculum; the computer class had nothing to do with the Math class or with any other classes in the school; these other classes were taught as usual; using blackboard and chalk, as if no advanced technology were present in the school. No few teachers even declared complete ignorance in the using of computers. In brief, computers arrived at Elementary and Secondary schools but at most they were incorporated in the traditional curriculum. It is simply just another topic for students to learn but little, if nothing, related to a new way of teaching or learning the different disciplines of knowledge.

Another study reported by the Federal government, shows very similar results. In that report the conclusions are:

"...the benefits of information technologies are positively related to a) a pedagogical project in the school, b) the teacher's competencies in their use and c) the educational paradigm of the school community. If one or more of these is missing, the power of information technologies will be very limited". (PNE 2001-2006 pag.119)
In brief, if one is to judge by these results one could conclude that the idea of a new teaching-learning paradigm as a result of simple access to computers by teachers and students is more a "good wish" than a real happening. However, politicians, parents, teachers and vendors could argue that the problem is that schools still do not have enough equipment and connectivity to see the expected effects; therefore, it is only a question of time to see that computers will have a positive effect in the teaching learning process.
This might be so. And in order to analyze this assumption, the present research project was designed.

Methodology and Results.

The research design of this project is based on the so called "Case Studies" which belong to the domain of qualitative methodology. The rationale for using Case Studies is as follows:

If universal access to computers with connectivity to Internet is a sufficient condition to use them in the teaching learning process then to analyze a specific institution with this condition could give us a good idea of their impact on the teaching learning process.

Of course, the analysis of one case would not be enough to reach definitive conclusion but if we find that this educational institution does not show a broadly use of computers in the teaching learning process then the assumption of politicians, teachers and parents would not be reasonably supported.
The institution selected was a private university in Mexico. In this institution there are computers everywhere; in the dorms, in the professors' offices, in the library, even in the dining areas there are computers. An all of them with connectivity to Internet. So if the former assumption were true, this institution would be the best to look at.

The Instruments.

In order to know the uses of the computers by students a "software and Internet counter" was installed in one of the Computer Centers of the university during the semester of autumn of 2002. This counter registered the number of times that software and Internet were used by students and by looking at that frequency some conclusions were derived. In order to complement this information some visits to the Computer Center were programmed. In addition, 20 professors were interviewed in order to know what kind of tasks they perform with their computers. Figs.1 and 2 show the results of the

counter.

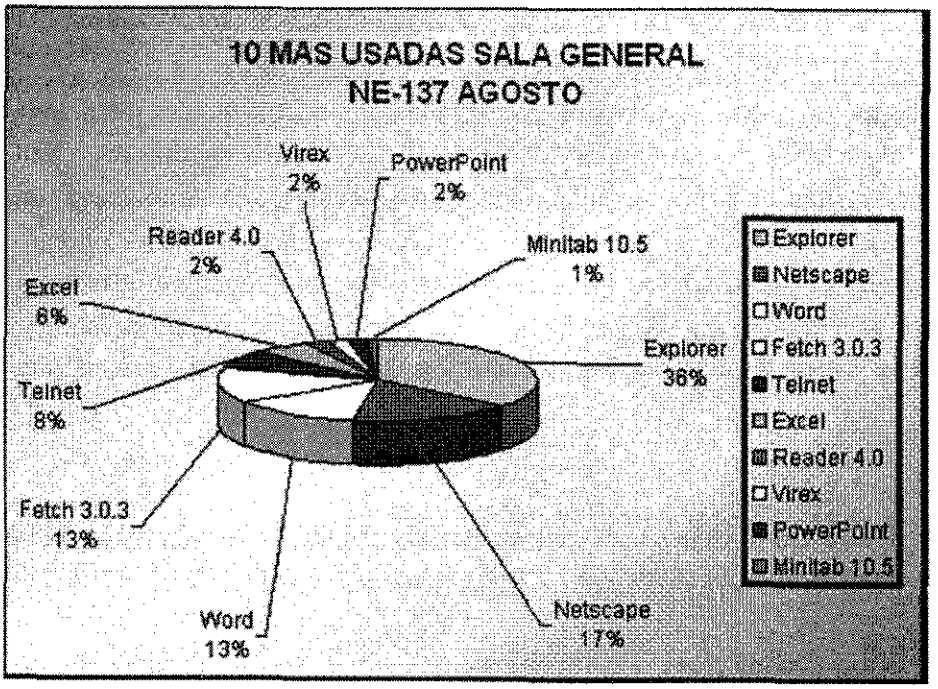

FIGURE 1. SOFTWARE MOST USED BY STUDENTS
AUGUST 2002

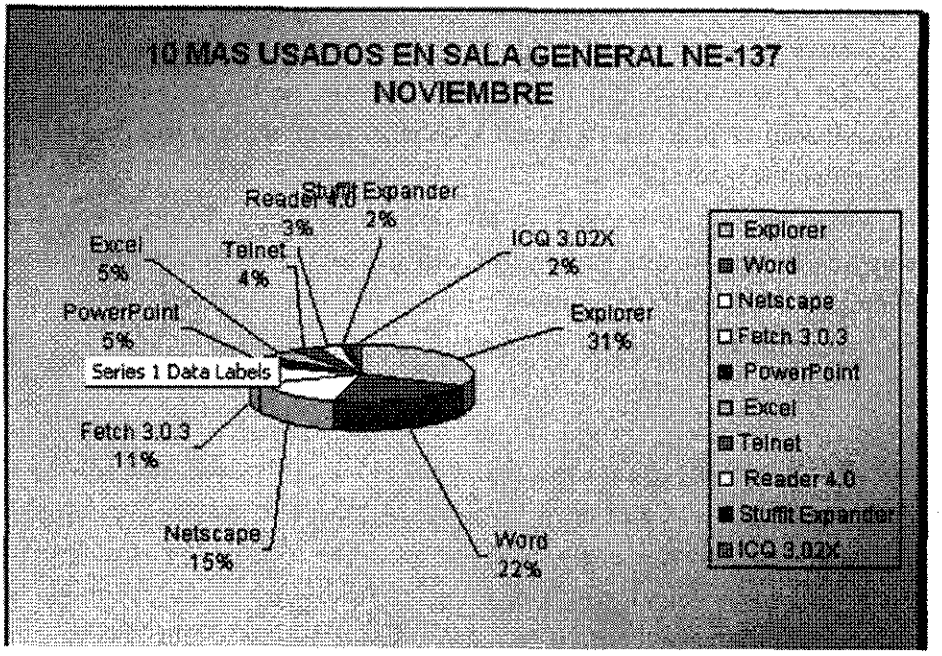

FIGURE 2. SOFTWARE MOST USED BY STUDENTS
NOVEMBER 2002

In Figures 1 and 2 it is observed that navigation on Internet is the most frequent use of computers by the students; at the beginning of the semester more than at the end; in August 61% and in November 50%. (This result is obtained by adding the percentages of Netscape, Explorer and Telnet). Now, when visits to the Computer Center were made to observe the uses of computers, it was found that Internet was used more for E-mail (60%). Chats (20%), (Music 7%) and other uses like just navigating with 13%.

Figs. 1 and 2 also show that Word is the software most used by the students, especially at the end of the semester (August 13% and November 22%). And Excel and Power Point are the software lest used by the students, with 6% or less.

As for the professors, they declared that Word was the software most used (65%), then E-mail (25%) and others like Minitab and Power Point 10%. .They declared that computers were used basically for writing their research reports (50%), contacting colleagues in other institutions and countries (25%), preparing their class materials (15%) and data analysis (10%).

With the exception of some courses in the Departments of Engineering, Sciences and Design of Information none of the more than 30 Departments were using software in the classroom for teaching-learning purposes.

During the interviews about 10% of the professors declared they use Internet to inform their students about their courses (Content, homework, dates, etc.) and other 5% uses Forums to exchange opinions , a similar percentage use the computer to elaborate didactic material such as Power Point presentations.

Interviews also served to know the reasons why professors do not use computers in their teaching, these are grouped in three groups; professors do not know, professors do not want and professors can not.

In effect, one of the typical answers was that they do not know how to use the computers for teaching. It should be remembered here that in México most of the university professors are hired when they have a degree in their area of specialization without being required a degree or certificate on pedagogy or something similar. Therefore most of them believe that teaching is just a matter of lecturing their students. With this assumption they do not see how computers can be helpful more than to prepare a Power Point presentation.

But when professors were asked if they have taken any of the courses the university offer in using technology in their teaching most of them said they have not taken them. Then a question was asked; may be the real reason for not using computers in your teaching is that you do not want it. The typical answer to this question was "yes, we want but we do not have time to take those courses". And this is true, a professor working in a university that gives more priority to doing research than to teaching spends more time in

research than in preparing their teaching. Therefore one may conclude that professors do not use computers in their teaching because they can not do it given that they are more preoccupied with doing research.

Conclusion.

The strongest conclusion of this paper is that computers are still far from having the expected revolutionary impact on the teaching-learning process. First, because students are using them more for entertainment purposes than for learning their disciplines, second, because professors do not know how to use computers in their teaching, third, because in some universities teaching is not a priority when compared to doing research.

And to connect my talk with Prof. Tanaka's, I would say that the university included in this study is a good example of the Type 1 model he was talking about, namely; at most, we have incorporated computers into our traditional ways of teaching instead of taking them as an opportunity to improving our way of doing our job.

Muchas gracias.

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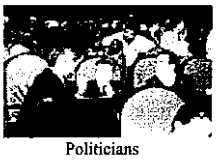
"Assessing the Effects of Computers on the Teaching-Learning Process"

Dr. José Alejandro Ramírez.
Universidad de las Américas, Puebla.
México.

In Mexico, a coalition of :


Politicians


Parents


Professors


Vendors

Create more access to new technologies in schools at all levels.

Politicans commited to social justice want to ensure that the new technologies will permit to offer education for all.

Parents and the information technology revolution

Educators

Radical change in the teaching learning process.

Vendors seek to sell computers and software

Access to computers have increased dramatically

In higher education institutions

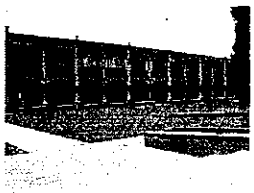
Assumption:

Access to computers ⟶ will transform the quality of education.

Research question:

¿Are professors using the new technologies for pedagogical purposes?

The On Campus Experience:



ITESM

UDLA

UDLA

Students

Professors

80-85% Word Processing: Write papers, course materials (hand outs and exams)

15-20% E-mail, Power Pont presentations and Entertaiment.

UDLA: A close circuit system

Students receive the image and sound of the professors class and navigate in the Web.

ITESM

Most of the courses that are taught on campus are also available on the Web as supporting material.

The Experience on Distance Education

ITESM

Very successfull quantitative experience

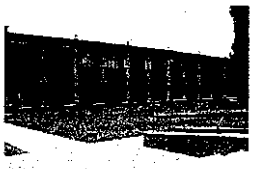
Versatility of Media: Video, Satellite Dish, Internet, Multimedia and E-mail.

Versatility of Programs: Undergraduate and graduate programs, training for employes, policymakers and others.

Cost: Very unexpensive tuition, shared tuition and others

The Experience on Distance Education

ITESM



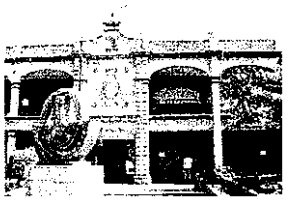
Constructivist Approach for marketing purposes

but...

Tradicional pedagogical approach in reality.

The Experience on Distance Education

UDLA



Masters program in bussiness.

Constructivist approach in intention but... also a tradicional pedagogical approach.

Conclusion:

Computers are still far from having the expected "revolution" impact on the teaching-learning process.

Muchas gracias