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The Integration of Computer Tools in Higher Education: Access To ICT And Difficulties Of Use

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ABSTRACT
Recently, it is well known that computer technology is seen as a means of teaching-learning and an inescapable teaching aid made available to teachers and students in order to remedy classical methods. The latter, although relevant and perennial, require a slower time and run risks involving constraints linked to the explanatory reasoning, carried out instantly in front of the learners, via diagrams, mathematical demonstrations, etc. where the omission is not At all negligible. However, computer tools have made it possible to master the time factor that has become an essential parameter, but also to facilitate communication, training and learning. The objective of this research in science didactics is to observe more closely and evaluate the current situation concerning the use of computer tools in university education. Given the exploratory nature of our study, we have opted for questionnaires as data collection instruments including themes related to access to multimedia courses on the Internet, ICT training or obstacles encountered. The results of the survey, after surveying the questionnaires for university professors and students of the Ben M'sik Faculty of Sciences, Casablanca-Morocco, which included the chemistry and physics disciplines, helped to supervise the situation, Teachers and learners to identify the obstacles encountered in integrating these computer tools and thus to assess the added value of ICT.
Key words: *Computer tool, higher education, integration, evaluation, ICT, obstacle*

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INTRODUCTION

Information technology is one of the elements of the current new technologies and one of the main aspects of the generation of these uses in many fields, in particular in education as well as in scientific and industrial centres. The present specificity of the introduction of computers into the teaching of experimental and exact sciences reside in its nature as a tool accessible to high school and university laboratories in developed countries [1]. Thus, the integration of information technologies and educational communication (T.I.C.E.) in physical science education has been studied by Akrim *et al* (2010) [2]. Computer simulation for learning the physical sciences was carried out by El Jamali [3]. In addition, Serizel [4] worked on self-training and meditative accompaniment using technologies of information and communication in education (T.I.C.E.). Erradi [5] noted that hypermedia in the service of continuing

education (design of software for learning the chemistry of CHIMSOL solutions). On the other hand, Khalidi [6] The tool of scientific investigation in the experimental teaching of chemistry He carried out the first didactic work on the integration of the computer tool in practical work and showed the importance of a match between these tools And their uses. In the light of this bibliographic data, we propose in this study to establish a diagnosis and to evaluate the current situation of the use of computer tools in the system of university education taking as an example the Faculty of Sciences Ben M'Sik of Casablanca knowing that this city represents a significant number of staff compared to the national level (Morocco) .The study will focus on the use of ICT in scientific matter among the professors and students for the current year 2016/2017.

Methodology

Development of study instruments

Given the exploratory nature of our study, we have opted for questionnaires as data collection instruments, which include three themes:

1- Using the computer,
2- Use of computer software,
3- Internet connection,
4- Creating Multimedia Courses on the Internet,
5- ICT Training,
6- Difficulties and obstacles to the use of ICTs.

Teachers' Case: Results and Discussion

The population covered by this study is composed of 100 teachers from the Ben M'sik Faculty of Science who were invited to respond to the questionnaire, the results of which are recorded in Figures 1 to 5.

Using the computer

The evolution of science and technology and the deepening of pedagogical reflection mean that computer science and computers are now a constituent element of the teaching of disciplines, especially those known as scientific ones [5]. Thus, the computer considered as a teaching machine comes to help the teacher in his course or during a session of practical work. Beaufils *et al*., (1991) have shown that the computer can be presented as a "super-overhead projector", since it can quickly and easily show experimental data, treatment results, curves and diagrams. Indeed, the integration of computer technology into the teaching process has given rise to computer-assisted teaching, which refers to all the techniques and methods of using computer systems as educational tools integrated into the teaching process in educational context [8]. In addition, the integration of computer-assisted experimentation as a demonstration tool for some concepts would allow students to develop their scientific rigor and critical thinking. Also, Beaufils and Richoux emphasized the importance of the integration of the computer as a tool of scientific investigation in the teaching of physical sciences in high school. In the context of the educational cooperation with the cultural and scientific service of the French embassy in Morocco, Khalidi *et al* [10] have realized the teaching of practical work, assisted by computer [(T.A.C.) Physics-chemistry practical guide]. In addition, Armouche carried out a mini-project on "Computer-assisted instruction and multi-agent systems" [11]. In our situation, we commented on the results found on the basis of histograms representing the percentages of the use of the various computer tools available to the teachers (Figure 1).

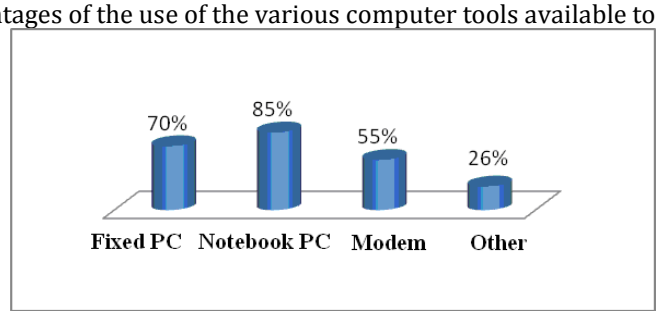

Figure 1: computer tools used by teachers

After the figure 1 we note that the great majority of teachers questioned have a wide range of computer tools and teaching materials to know fixed PC, notebook PC, modem, CD-ROM, software.... whose use becomes important if this is not strictly necessary. Below, we give the results on the different organizational and operational issues for teachers.

Use of computer software

Computer science has enabled the development of tools for the processing and retrieval of information which has become a multidisciplinary field. The introduction of computer science in the teaching of

experimental sciences characterized by the use of the computer as a "machine to teach", demands to conceive? And to use software that has automatic acquisition capabilities and numerical and graphical analysis tools [12]. Thus, this software allows, for example, certain individualization, a development of the autonomy and the creativity [8]. In addition, the associated software covers a wide range of applications, from automatic acquisition (several hundred measurements per second for example) to digital processing and data analysis (smoothing, digital integration, optimization of parameters, etc.). .) [5]. Indeed, KHALDI and al have used simulation software for the analysis and processing of experimental chemistry data [13](acquisition, processing, simulation, and hypermedia). It emerges that it is important for the teacher to learn precisely the application of software so that he can integrate it in its didactic approach, which favours a better matching of the software with the didactics of the sciences. Computer simulations based on different software are used, for example, to illustrate a theoretical knowledge. And can also be used to experiment a model and to interpret experimental observations, etc. [15]. Indeed, LEWIS et al. Have proposed pedagogical approaches using computer simulations to develop mental models in learners [14]. The results obtained from our analysis (Figures 2 and 3) show that computer (software) resources (Word, Power Point and Excel) are already widely used by teachers to implement their course, Td and TP. Power Point is the most used computer software for teachers to disseminate their course (95%).This will allow the way to new possibilities for the act of learning in scientific matters among university students.

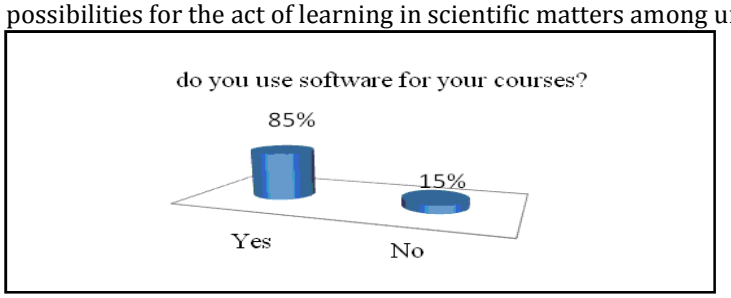

Figure 2: Percentage of use of computer software by teachers

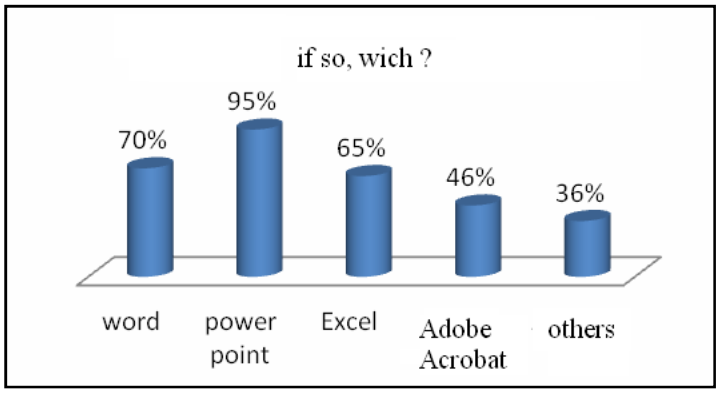

Figure 3: software used by teachers

Connecting to the Internet

Through the ICT development, especially the Internet, students find electronic resources that are useful to them during their training. These electronic resources include computer systems and electronic documents; they are used by students in addition to the information and content seen in curses. These electronic resources include computer systems and electronic documents; they are used by students to complement the information and content seen in progress [16]. Thus the Internet constitutes the global network for the dissemination of information under Electronic format for teaching, research, technology, economics, industry... Indeed, the Internet offers teachers and researchers the possibility of carrying out their research in a very wide and time-consuming manner, which delimits the relationship between the learner and the matter taught. Katir et al. Interested in the content development strategy for public administration websites in Morocco [17]. KAFIF stressed that the Internet is considered as an information and communication tool [18]. This author noted that the Internet was meant to fill a need for communication and its impact on human society is much deeper because it is the media that has been able to encompass all the old modes of communication, Mutation in the history of human communication.

Creating Multimedia Courses on the Internet

A media is defined as any support or medium based on technology that allows the dissemination and preservation of information (Radio, Television, Press, Book, Advertising, Internet, etc.) constituting both a way of expression and an Intermediary transmitting a message to the intension of a group [8]. Thus,

Hachette defined Multimedia as a technique enabling audiovisual supports (texts, sounds, still and animated images) to be put together on the same medium and computer means (programs, data) to be disseminated simultaneously and interactively in different fields [8].Through the Internet, learners can access educational resources and other tools (communication via addresses such as e-mail, social networks and even cats.) This type of training is also called Web-Based Training [9]. The result of Figure 4 shows that the majority of professors would like to create multimedia courses on CD-Rom, DVD or Internet, which allows the user not to remain inactive before a presentation, but to be able to act or intervene During the presentation in order to detect the maximum information and thus to improve its understanding.

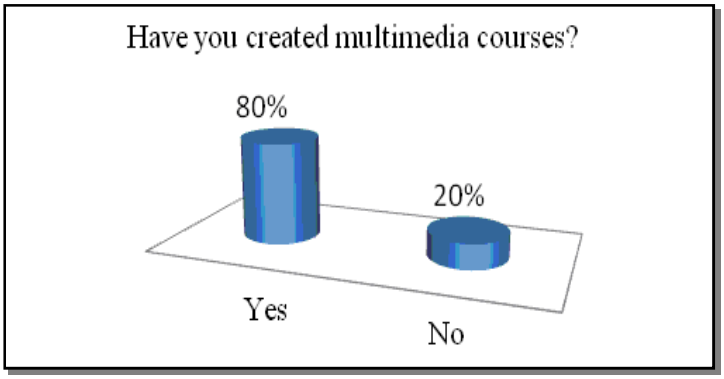

Figure 4: Creation of multimedia courses on the Internet by teachers

Training in ICT

Information and Communication Technologies (ICT) such as computers and Internet can provide important contributions and platforms of support for teachers and learners [8]. Following the recommendations of the national education and training charter in 1999, several efforts to introduce ICT into education were deployed. Thus, the GENIE-SUP project has generalized the ICT in the higher education system, which is based on five main components:

- Encourage training in the field of ICT;
- Strengthen the use of ICT in education and training;
- Develop digital and educational services.
- Promote ICT in the field of research;
- Strengthen structures and infrastructure.

In addition, as part of the promotion of the ICT use for education, training and research, in 2002 the Ministry of Higher Education created a national network MARWAN (Moroccan Academic and Research Wide Area Network) aiming at the valorisation of research work by electronic archiving, processing and dissemination of knowledge [19]. The bibliographical analysis shows that the ICT use in general education has been the subject of several studies in the sciences of education. Indeed, Cleary et al have analyzed the determinants of ICT integration in the classroom [20] .In addition, the integration of ICT in the teaching of the physical sciences in Morocco within the framework of the GENIE program: difficulties and obstacles, was studied by Benjelloun, who showed that 94.4% of the teachers interviewed expressed a great interest in Use of ICT in their teaching practices. However, only 8% of them integrate ICT on a regularly in the classroom. At the same time, Bibeau studied the basic elements that can influence the success of ICT integration in education and training and stressed that the ICT promote student motivation and enable the development of higher order cognitive operations. In addition, Biaz and al have studied the integration of ICT in teachers 'work and conclude that the improvement and evolution of the quality of education is based on the importance of teachers' training in the optimal use of ICT. In the light of these bibliographic data and the interpretation of the teacher quiz, we noted that the majority of teachers would like the need for ICT training and have taken the initiative of training in the use of ICT (Figure 5). It follows that these results can accelerate the development of education in our education system, as well as in the training of managers. In addition, this type of training, which is increasingly being introduced in the different branches of higher education, be it in faculties or schools and institutes, is a real opening for teachers and students on ICT.

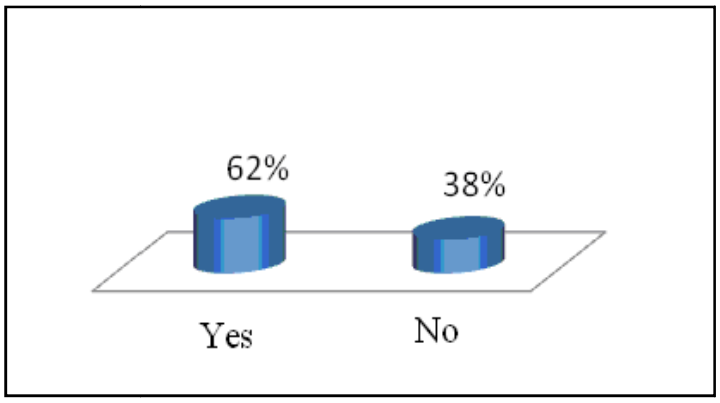

Figure 5: Training in ICT for teachers

Students' Case:

Analysis of the questionnaires shows that learners were trained in both word processing (40%) and spreadsheet use (33%), those who indicated they were trained in image processing software (10%), have done so by attending private training centers in office automation.

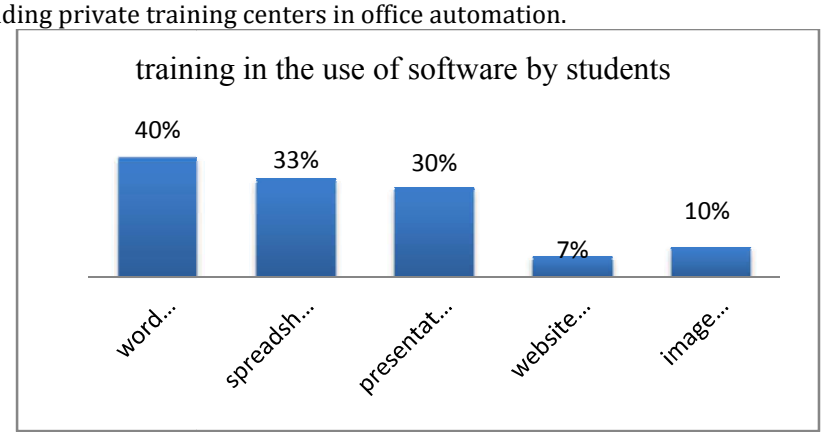

Figure 6: training in the use of software by students

Before discussing this paragraph, it should be noted that the survey shows that students, in about 97% of the sample, have an email address.

Connecting to the Internet

The results show that almost half (45%) of the students use paper documents as a source of information for the realization of university work, while 18% of students use websites.

Paper documents	Use of websites	Use of websites and paper documents	Neither of the two
45%	18%	32%	5%

Table 1 : Access to documentary ressources

Unlike teachers, we found that 37% of students take ICT training at their university, while only 11% use ICT for their learning.

Obstacles to the use of ICT

Following an earlier study on the identification of obstacles to the acquisition of the basic concepts of a chemistry descipline towards students [22], the table Bellow shows other difficulties mentioned by university students in the use of ICT which are linked to various logistical and technical problems but also to teaching methods. For example, 43% of students find it difficult to connect to the Internet, 60% of them due to lack of training and 67% due to lack of knowledge of the internet resources available in the training. At the top of the difficulties, 77% were identified, reflecting the low level of ICT knowledge, followed by 72% on the lack of pedagogical and technical support. There are also problems with access to technological tools in the academic community (63%). In all these constraints, the pedagogical role of the teacher taking into account the computerized contents taught are also called into question.

Type of obstacle	%
Lack of pedagogical and technical support	72%
Lack of knowledge of internet resources	67%
Lack of training	60%
Difficulties connecting to the Internet	43%
Difficulties in Accessing Computer Equipment	63%
Low level of ICT knowledge	77%
Inadequately equipped computer rooms	70%
Problem of massification of learners	30%

Table 2: Obstacles to the use of ICT in learning.

As for teachers, the difficulties of use and access to ICT are relatively logistic rather than training and are related to budgetary allocations allocated to the computer sector which is attributed little attention in our Moroccan education system.

CONCLUSION

In this study, we conducted a survey of students and research professors in different disciplines at the Ben M'Sik Faculty of Sciences in Casablanca, Morocco, where we established a diagnosis and identified the current uses of information technologies and of communication (ICT) as well as the obstacles encountered. Indeed, the results obtained show that the integration of the IT tool in higher education is essential at the organizational and operational level as well as on the learning plan. Training in the use of ICT thus seems to be a necessary locomotive for the development of education in general and the improvement in particular of the quality of the Moroccan education system.

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