

Assessing the Uses of ICT in a Private Lebanese University
Changes in the Working Modes of Teachers and Librarians

by

Amal Ghattas Daouk

B.B.A, American University of Beirut, 1992

M.B.A., Lebanese American University, 1995

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Student Name: Amal Ghattas Daouk I.D. #: 199204690

Project Title : Assessing the Uses of ICT in a Private Lebanese University:
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School : **School of Arts and Sciences**

Approved by:

Project Advisor: Iman Osta, PhD

Member : Mona Nabhani, EdD

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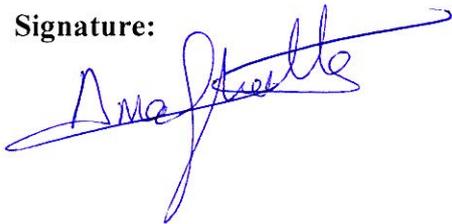
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DEDICATION

To my dearest, most supporting family, Mohamad Kheir, Dima and Karim who taught me the secret of success and planted encouragement in my heart.

To my beloved mother, my role model, who was always supporting me morally and intellectually. To the memory of my father, a big believer in education and success.

To my caring mother in law who always pushed me towards success.

ABSTRACT

With the globalization of businesses and the dramatic advances in technology, institutions of higher education acting as creators of future leaders found it necessary to incorporate in their curricula and daily operations the use of new tools of instruction and management, Information and Communication Technologies (ICT). The Lebanese American University (LAU), an American university located in Beirut, Lebanon is no exception.

The aim of this research work is to assess ICT uses in a private Lebanese university, in the service of academic life. The study takes into consideration faculty's, IT administrators' and librarians' beliefs about, and uses of technology in their academic work.

Qualitative and quantitative analysis are used in this descriptive/ assessment study. Different groups of individuals are compared and contrasted in terms of differences according to certain criteria. Questionnaires distributed to twenty faculty members in the School of Business and twenty faculty members in the School of Arts and Sciences, and interviews with four faculty, seven librarians and three IT staff at LAU are also used in gathering the data needed. The researcher hopes these results will help educators and future researchers and other entities at the university make constructive changes in their endeavors.

The results show that technology is developing very fast at the university and it has many usages. Teachers use technology for course preparation, registration, research and publications and to put material on line. They also use it to communicate with students, faculty and university administration. Librarians use technology to order and to select books, to communicate with other libraries abroad and to run the work flow. The use of ICT is changing the teachers' and librarians' working mode to the better.

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INTRODUCTION

Technology is invading the world around us and influencing our daily life. Information and Communication Technologies (ICTs) are affecting business, education and all other sectors. The influence of ICT is depicted by the change and progress made in society, where access to information and communication is much more affordable than it was in the past. ICT has the power of enabling people to perform old jobs in new and better ways, and to do tasks that they previously were unable to achieve.

Particularly, universities are caught in a time of rapid technological change. The pressure on universities has created the need to look at teaching and learning practices in a new perspective to meet the challenge of the society and the wider academic communities. Most universities in Lebanon are using ICT and trying to bring the world to students and to open new paths for communication with different universities outside the country. Many universities in Lebanon are implementing ICT out of a need to apply new and more effective processes in administration, library management, classrooms and offices, which will enable teachers, students and staff to accomplish their daily work in more efficient ways.

Context of the study

The Lebanese American University (LAU) is an American - chartered University with a board of trustees stationed in New York City. It has two campuses, one of which is located in Beirut. LAU was founded in 1835 as the American School for Girls. Then in 1924, a two-year program was added to the curriculum, creating the American Junior College for Women. Later, in 1948, the college program was expanded into a university-level program, and the institution was renamed Beirut College for Women (BCW). In 1970, the Lebanese

government officially recognized BCW's Bachelor of Arts (B.A) and Bachelor of Sciences (B.S) degrees as equivalent to the national "License" degree. Later, in 1973, the College changed its name to Beirut University College (BUC) after accepting male students into its program. The college expanded and opened two new branches, one in the north and one in the south of Lebanon. The board in New York, in 1994, accepted BUC's request to change into the Lebanese American University (LAU), reflecting further growth and the addition of several professional schools (Lebanese American University, 2010a).

In its mission statement and goals, LAU emphasizes the use of Information Technology by students, faculty, and staff. LAU's vision statement puts an accent on the enhancement of the use of Information technology by "Providing a state of the art infrastructure and support services that will enrich the student, faculty, and staff experience" (Lebanese American University, 2010b). Similarly, the first "Initiative" of the University's strategic plan is Academic excellence (Lebanese American University, 2010 c); among the tools needed for academic excellence is "the development of smart classrooms and the utilization of the latest information technology in learning". In recent years, LAU introduced the use of WebCT, and subsequently Blackboard, as a platform for online communication between faculty and students. Thus LAU is in the process of creating an efficient ICT environment that would boost the university and its community into a leadership position.

Purpose

The aim of this project is to assess the different academic uses of ICT in a private Lebanese university (namely the Lebanese American University, LAU) in the service of the academic life of the university. The study aims also to explore the effect of ICT uses on the working modes of teachers and librarians. The term “working modes” refers to the habits adopted by teachers and librarians in the university while performing their job tasks. The LAU campus in Beirut is selected for convenience purposes.

Qualitative and quantitative research methods are used. This study attempts to find answers to the following research questions:

1. Who uses ICT in this university? For what purposes?
2. What are the major learning and/ or teaching uses of ICT?
3. How did the use of ICT change teachers’ and librarians’ working modes?
4. What obstacles are faced, if any?
5. What is the role of the IT Department in fostering ICT use in the university?
6. In which direction is the use of ICT at LAU evolving?

Significance of the study

The use of technology in education is advancing rapidly because it stimulates and supports teaching and learning, and affects students' motivation, socialization and creativity. The use of technology in education is aimed at modernizing universities and equipping students with new skills that will make them able to cope with changes in the work place once they graduate from the university. ICT reduces teachers' work-load by making planning and resources available over the internet. It also facilitates research, a major mission of higher education. Monitoring and assessing the extent and quality of ICT use are necessary steps in the intended change process.

On the other hand, LAU can serve as a model for educators and policy makers at other universities and educational institutions, to understand how technology can change working modes and to identify the possible obstacles hindering its implementation. The data to be systematically collected and analyzed in this study are expected to present a picture of ICT use in a university and to motivate such plans in other universities. The results will also be useful to LAU itself as they will serve as interim evaluation of the ICT use by teachers and librarians. They will as well provide the IT department with information on eventual difficulties faced by end- users.

LITERATURE REVIEW

With the globalization of businesses and the rapid advances in technology, institutions of higher education acting as creators of future leaders found it necessary to incorporate in their curricula the use of new electronic tools of instruction. In general, the use of technology in instruction has evolved rapidly since the 1960s when teachers used the blackboard, flip chart, and projector (AlHashim, Sankaran, & Weiss, 2003). To maximize the use of technology in an informed way, thus incorporating it in the curriculum, well trained teachers should introduce technology to small groups of learners (teachers and students) to enable them to overcome their fear from technology and to justify its use (Vallance & Towndrow, 2007). In general, technology will add value when it is used as a tool that facilitates activities, facilitates the learning process as to place and time, facilitates access to information, helps to store and recycle instructional material, enhances discussions in classrooms and does not duplicate previous material (Vallance & Towndrow, 2007).

With the introduction of microcomputers in the 1980s, universities established computer labs for use in the instruction process. During the 1990s, the introduction of Windows, a user friendly operating system, and the computer literate generation of students, made it easier to use electronic instructional methods, mainly the PowerPoint presentation in classrooms and the Internet for research (AlHashim, Sankaran, & Weiss, 2003).

Using ICT in Teaching

Teaching embraces teaching methods, types of assignments, interaction with the students, assessment tools, and many other topics. Information and Communication Technologies (ICT) reduces teacher work-load and improves the learning process by making resources available over the internet, “many teachers find that interesting and well-planned

tasks, projects, and resources provide a key to harnessing the educational potential of digital resources, Internet communication and interactive multimedia to engage the interest, interaction, and knowledge construction of young learners” (Richards, 2005, p 60).

In addition, ICT has changed the teaching methods of teachers, to include on-line teaching and interaction tools such as WebCT, using PowerPoint for presentations, spreadsheets and many other facilities. The old teaching methods of faculty giving a lecture using transparencies and chalkboard, and the students taking notes, will fail to make “efficient use of faculty time for disseminating information to large groups of learners or for learning by students with diverse backgrounds and skills”(Nantz & Lundgren, 1998, p.57).

On-line courses

On-line courses such as WebCT-based courses deliver learning and communication using the Internet and Intranet with or without a face- to- face approach. In Ontario universities and colleges, a survey was conducted on the use of WebCT. The results indicate that 87% of WebCT-based courses are currently in use, meaning that “face to face” courses are being improved with on-line learning (Epper & Bates, 2001). Similarly, in a study conducted in Austria, Solosy (2003) concluded that by using on-line courses and WebCT, students had “the opportunity to develop IT literacies and multimedia literacies, as well as enhance the acquisition of English literacy skills both functional and critical” (Solosy, 2003, p. 35). The working modes of the teachers shifted from “content-based expert to facilitator for problem-solving, teamwork and communication” (Solosy, 2003, p. 35). Thus, the use of on-line courses facilitates teaching and enables the lecturers to store and display the learning material for the course. Students can download the material posted and work on it. A case study showed that the availability of the learning material on-line was approved by most of the students, “the students found particular advantage in the ready availability of the

materials also from home, the quick exchange and easy processing of data” (Koubek & Jandl, 2000, p. 162).

Assignments

The solving modes of assignments changed with the new technology. Students can collaborate in writing reports “using tools in Microsoft Word such as insert comments and track change” (Brakels et al. 2002, p. 74). Word processing enables students to create their own documents, using graphics, tables, charts, and drawings. Research summarized some thoughts of teachers: “a significant number of the students discovered for the first time that the drafting process is in fact far less onerous when completed on the computer. Most importantly, they became far more efficient readers of their own work in terms of structure and content, because they knew spelling and grammar would be picked up for them” (Solosy, 2003, p. 38).

Teachers may nowadays require the students to solve assignments using spreadsheet applications such as Excel or any other statistical software that has the ability to track, analyze, store and retrieve data, and perform calculations.

Interaction with students

Information and communication technology improved the relationship between teachers and students by using the Electronic mail. According to Partee (1996) “E-mail enhances personal counseling opportunities and facilitates direct students contact” (p.79). The advantage of the E-mail is that it “is famous for being non-intrusive” (Partee, 1996, p.82), nothing can interrupt it. E-mail allows teachers to extend their office hours and to avail themselves at any time. Teachers may request the students to send homework electronically, using the e-mail. Teachers can correct and edit the homework, and can reply by entering some commentary or guidance at the appropriate point (Partee, 1996). In addition, the

relation between teachers and students can be more interactive by chatting on the internet.

Similarly, teachers can build an electronic record of their students.

Presentation tools

Recent research shows that numbers of lectures have been substituted by interactive Microsoft PowerPoint presentations (Brakels et al. 2002). Faculty are able to change the delivery method of information by using PowerPoint presentations or other forms of electronic presentations, where slides are designed in a format that cannot be delivered on the chalkboard (Bates & Waldrup, 2006). Nevertheless, this technology has a high cost, which raises the question of whether the cost of technology is justified by the benefit of enhancing students' learning (Bates & Waldrup, 2006).

PowerPoint is a powerful communication tool that is heavily used in teaching and business (Craig & Amernic, 2006). More than 400 million software copies of PowerPoint were estimated to be in circulation around the globe and around 20 to 30 million PowerPoint-based presentations are given each day around the globe (Simons, 2004). In a similar study, D'Angelo and Woosley (2007) investigated whether technology in the classroom enhances the learning of students. Students showed a belief that using technology enhanced their learning. Similarly, teachers like to use PowerPoint because it extends their ability to communicate with the students. PowerPoint presentation enables the teacher to match the tone and purpose of the presentation with color-coordinated background, to raise the students' interest with animated slide elements and to increase the students' attention and understanding with inserting graphics, sounds and video clips. In addition, PowerPoint, as an application, is easy to use; teachers become more organized and experienced in preparing a full lecture by using abbreviations and short phrases that they actually begin to think in terms of bullets and abbreviated sentences (Adams, 2006).

Literature about PowerPoint varies from very negative to very positive views. Some studies reflect a belief that PowerPoint harms the students and does not deliver the needed information as suggested by the curriculum, and some others reflect a belief that PowerPoint has the capacity to increase the of students' interest in the subject presented. Tufte criticizes PowerPoint presentations that "elevate format over content" (Tufte, 2003, p.1). PowerPoint was also described as a product that induces stupidity and distorts data and that it is used as a substitute for the presentation rather than being a supplement for it (Tufte, 2003).

Frey and Birnbaum (2002) studied the perceptions of one hundred sixty undergraduate students at the University of Pittsburgh on the value of PowerPoint presentations in lectures. The PowerPoint presentations were posted on the course website for students to print and bring to class (Frey & Birnbaum, 2002). Most of the students reported that PowerPoint presentations lead to organized lectures that held their attention, mainly when visual images were used rather than plain text (Frey & Birnbaum, 2002). However, students' attendance and class behavior were not affected by the PowerPoint presentations (Frey & Birnbaum, 2002).

Jennifer Clark (2008) found, through surveying 46 university students, that students preferred and enjoyed seeing pictures and listening to the lecture at the same time, more than listening to a lecture alone. PowerPoint presentation maintains students' interest because of the different slides' style, format, color and design.

A number of studies on the use and the effect of ICT were conducted mostly in the United Kingdom and the United States (Craig & Amernic, 2006). The studies usually involved analyses of small classes that are taught by the researchers (Craig & Amernic, 2006). Some of the studies took place before the wide use of PowerPoint in education whose results were influenced by the "novelty" of the instruction method (Craig & Armenic, 2006, p. 150). Most of the results of the studies indicated that students liked PowerPoint lectures

and found them more interesting than the traditional lectures. The studies conducted by Szabo and Hastings (2000) at Nottingham University in England, had similar results: students believe that using PowerPoint in lecturing captures attention more than the traditional methods, makes lectures more interesting, motivates students to come to class, and results in better restructuring of lectures. It “may help the students better understand the material” (Szabo & Hastings, 2000, p.181). On the other hand students’ attention may be captured by “the use of illustrations, a preference for light-colored background, the use of colors, and the line-by-line projection of lecture concepts” (Szabo & Hastings, 2000, p.181). However, PowerPoint lectures, in some circumstances, add to the entertainment rather than to the education of the students (Szabo & Hastings, 2000).

Similarly, Bartsch and Cobern (2003) conducted studies to test the effect that the contents of the slides have on student learning and enjoyment. They conclude that graphics or other material that is not related to the subject taught would negatively affect students’ learning and enjoyment. However, including related pictures has no effect on the enjoyment or learning of students. Thus they conclude that pictures are not needed to capture students’ attention to the lecture material if the lecture material is interesting and understandable (Bartsch & Cobern, 2003).

Another similar study was conducted by Bates and Waldrup (2006) on Business students to test the effect of PowerPoint lectures on students’ attitudes and performance. Four sections of a course were taught over two semesters by the same instructor using the same quizzes, syllabi, and grading scale (Bates & Waldrup, 2006). During each semester, one section was taught in traditional method of instruction using a blackboard and overhead transparencies, and another section was taught using PowerPoint for lectures, problems, and exercises. The results of the study indicate that there is no significant difference, neither in grade

distribution between the sections, nor in the students' attitudes towards the course (Bates & Waldrup, 2006).

On the other hand, teachers might fill the slides with quantities of information without thinking about their content and how it is presented (De Wet, 2006). Similarly, the overuse of clip arts and animations on the slides could distract the students from the lecture information (De Wet, 2006), which would lower the students' achievement on their tests (Murphy, 2004, cited in De Wet, 2006). In addition, students may think that if information is not on the PowerPoint, then it is not important, especially when hard copies of the presentation are distributed to students (De Wet, 2006; Adams, 2006).

PowerPoint has changed the students' habits; they no longer listen to teachers in order to be able to take notes, but rather they watch the screen with the hard copy of the presentation in their hands (Adams, 2006). In such an atmosphere, dialogue is disrupted because faculty would be busy reading the presentation to the students who would be silent observers and listeners (Adams, 2006). The above style of instruction is called "monologic" (Nyrstand, 1992, as cited by de Wet, 2006, p. 33) whereby the teacher dominates the dialogue and becomes "the center of action" (Creed, 1997, p. 2).

The teacher loses the human relations with students such as "eye contact, movements, vocal expressiveness, and smiling" which are the characteristics of teaching without PowerPoint (Hartnett, Romcke, & Yap, 2003, p. 315).

A similar view is that PowerPoint is another instruction tool and by itself is not the champion of good teaching; it is how teachers use PowerPoint to achieve the objectives of curriculum and education that makes the difference (Bhaerman & Selden, 1970, as cited by De Wet, 2006). The goal is to combine "what students learn" with "how they learn" to build a student with the required knowledge and the ability to apply this knowledge (National Research Council, 2000, as cited by De Wet, 2006, p. 32). In other words, the instructional

practices affect students' understanding of the contents of the curriculum (Erickson, 2002; Wiggins & Mc Tighe, 1998 as cited by De Wet, 2006), and would lead to students with "intellectual identity", and "intellectual autonomy" (Kaplan, 2004, as cited by De Wet, 2006, p.33). Hence when teachers select PowerPoint as their instructional method, the presentation is to be prepared to satisfy the above goals (De Wet, 2006).

Assessment tools

Assessment is essential to educational practices. In the United Kingdom, e-assessment plays an important role in defining and implementing curriculum change, and e-assessment has a direct effect on curriculum and classroom practices (Ridgway, McCusker & Pead, 2004). In the United States, content area specialists continue to collaborate with the department of education in order to provide information about computer adaptive testing of students' achievement levels in the classroom (Whitehead, Jensen & Boschee, 2003).

ICT helps also in assessing students' contribution to group work. The effect of ICT on the working modes of teachers in their teaching creates collaboration between the students. In a traditional course, teachers cannot monitor the collaborative work of students and cannot have insight of each individual's participation, before handing the group work. However, with ICT tools like the Blackboard, teachers can know to which extent each student collaborates in the group work. In addition, ICT gives the opportunity for introvert students to express and communicate their ideas to teachers and to other students through the use of the Internet and e-mail system. Students realize this way that their ideas are worthwhile.

IT role in university libraries

The role of information technology is to support the teaching and the learning process and to encourage research work at the university by providing easier access to resources. It provides technological services to the university library in support of its academic and research

missions. As knowledge and technology continue to become strategic tools in teaching, research, and in administration at the university, it is important that knowledge development and technology implementation and support in the academic library be efficient, timely, and cost-effective.

The merger of computers and telecommunication with the academic library creates an opportunity for expanding knowledge. Information is now shared by many readers at the same time, and in different places. According to Mary Lou Goodyear (1995) “we can hold the same piece of information simultaneously in many different places, duplicating the exact piece, easily and efficiently.”(437)

According to many researchers, the searching process for information is very different now from few years ago. A computer connected to the Internet is much more reliable than using a terminal connected to a local network to access a CD-ROM. The availability of electronic resources throughout libraries made the librarians’ role different from the past. They have to instruct users how to navigate and use the different websites available on the net. Moreover, librarians assist students and teachers in using the library catalog, the on-line databases and index, the search engines, the e-journals and e-text and to choose the relevant results.

IT role at LAU

The information Technology Department at LAU is in charge for the university’s infrastructure and information system and their security. This includes databases, servers, phones, networks, Internet, e-mail system, video conferencing systems, Library Systems, Banner Student Information System, Alumni Systems, University Administrative System and Course Management System. (Lebanese American University, 2010d). The mission statement and vision of the IT department is “to provide robust, reliable and secure IT systems and services that foster a productive environment for LAU’s students, faculty and

staff”, and “to create a world class IT environment that supports LAU’s mission of excellence in teaching, learning and research”(Lebanese American University, 2010e).

“Information Technology department is responsible for the infrastructure, hardware, software, web publishing, on-line marketing, and software development/ integration needs of the academic library”.

The Riyad Nassar Library was first established in 1934, in Beirut campus. Over the years, with the rapid expansion of growing academic programs and digital environments, the library moved to more spacious premises until reaching its final destination, in 2005.

The Riyad Nassar Library is a Learning Resources Center along with the Audio-Visual Center. It has over 224,000 information records and 960 current periodical subscriptions. Among these numerous resources, special interest collections may be found, such as: the collection of book and non-book materials on feminist studies that support the Institute for Women’s Studies in the Arab World, the Practice Teaching collection for students majoring in education, the Audio Visual collection to support instructional activities on campus, the Islamic Art and Architecture and Islamic Artifacts collection, and others.

Throughout the year, individual instruction, orientation, research assistance and training sessions are offered to faculty, staff and students (Lebanese American University, 2010f).

Research tools such as the Library Catalog, ZPORTAL, Digital collections, Online Databases, Find It, e-Books, Open Access Resources, Trial Databases, Free e-Journals, Useful Websites are available on-line to end- users. The ZPORTAL is a search engine that allows end-users to retrieve information in less time, in a consistent and cost effective interface (Lebanese American University, 2010g).

METHOD

The present study adopts a mixed method, consisting of both qualitative and quantitative data collection and analysis techniques, namely questionnaires and interviews. The population of the study includes faculty and librarians, who are the agents for running academics (teaching and research) at the university. The faculty members of two schools located at Beirut campus are considered: School of Arts and Sciences (SAS) and School of Business (SB). On the other hand the population also includes the IT department officials and personnel, as they are the providers of technology services to faculty and librarians.

Questionnaire

The questionnaire was administered to a sample of faculty members consisting of two groups, one from the School of Arts and Sciences (SAS) and one from the School of Business (SB) randomly selected from the list of teachers. The sample consists of twenty faculty members from SAS and twenty from the SB randomly selected from the different disciplines in each school, i.e., from the departments of: Humanities, Education, Social Science, Computer Science and Math, Natural Science, and Arts and Communication. From the SB, the sample consists of faculty members from the departments of: Economics and Finance, Management and Marketing, and from the Accounting and Hospitality. The researcher considered 40 participants, 20 SAS and 20 SB as a representative sample for analysis because of the limitation of the study to two schools only available in Beirut campus. The researcher did not ask the librarians to fill a questionnaire because of the limited numbers of librarians at LAU Beirut campus. Interviewing them seemed to be a better method.

Interviews

The researcher used semi- structured interviews with academic administrators and librarians. Fourteen participants were interviewed upon their consent. The participants selected for interviews are heads of academic units, i.e., the Assistant Dean and one Chair of the School of Business and the Assistant Dean and one Chair of the School of Arts and Sciences. In addition, six librarians were interviewed: The library director, the computer center supervisor and library staff from the departments of: cataloguing, circulation, inter-library loan, and acquisition. Three IT staff members, the Assistant to the Vice-president for Information Technology, the Director of IT applications and solutions and the network and communications manager, and also one person from the academic computer center were interviewed as well. This heterogeneous group of people was selected on purpose: different gender, age groups, and backgrounds were chosen in order to get diversified views about the issue.

Development of the Questionnaire

Before designing the questionnaire the researcher had to make several decisions such as:

- What questions should be asked?
- How should each question be phrased?
- In what sequence should the questions be arranged?
- What questionnaire layout will best serve the research objective?
- How should the questionnaire be administered?

Several drafts were written and refined to make sure that the questions are as clear, unambiguous, and appealing as possible, in order to encourage the cooperation of the participants to answer as close as possible to what they consider to be the truth, based on their work experience and their reasoning.

The questionnaire is Likert type, whereby the respondents had to choose from a five-point scale, ranging from “strongly agree” to “strongly disagree”. The respondents indicated their attitudes by checking how strongly they agree or disagree. This type of scale is extremely popular for measuring attitudes because the method is simple to administer (Burns, 2000).

In preparing the questions the author avoided leading questions and used simple, clear words, and short sentences to explain the ideas presented. Also, ego threatening questions were avoided because they can increase resistance to participating as well as the probability of collecting biased answers. Positive statements were used avoiding questions with negative connotations (Cohen & Manion, 1997).

Piloting

The questionnaire was piloted by administering it to two faculty members who were selected on a convenience basis and who did not belong to the selected sample of participants. In this pre-testing phase the two participants were asked to look for such things as difficulties with question wording, problems with leading questions and other biases. This trial run convinced the researcher that the questionnaire was appropriate and that no potential problems are expected to occur. For instance, the respondents will not have any difficulties understanding the questionnaire and there are no ambiguous or biased questions.

No questions were modified based on the pilot.

DATA ANALYSIS TECHNIQUES AND STEPS

As mentioned before, the number of participants is 40 faculty members. In order to keep equal representation in the sample, the researcher selected twenty faculty members from the Business School and twenty from the School of Arts and Sciences. The software used presents the results of the questionnaire in frequencies which tells how many people selected each of the responses to the question (i.e., strongly agree, agree, disagree, etc.). It gives the number and the percentage of people who gave each response, as well as the number of people who did not respond. This type of results gives insight into the data and enables the researcher to make important decisions with confidence.

The software package SPSS, (Statistical Package for Social Sciences) was used to analyze the data collected. In fact SPSS gives a full set of statistical tests which help in telling if relationships are meaningful or differences are significant. The data was entered and the name of the variables was specified. Then a frequency table was constructed in order to show the distribution of the responses according to the different categories. Finally, an Excel sheet was prepared where the data was organized according to the research questions in order to reach a synthesis of the results.

On the other hand, the researcher used semi-structured interviews with academic administrators, librarians and IT staff. Fourteen participants were interviewed upon their consent. The interviews were audiotaped then transcribed. The researcher coded the transcript of each interview according to themes related to the research questions. She then organized the coded data from all interview transcripts according to the research questions. Data under each research question was then synthesized to come up with answers.

The names remain anonymous and a coding system will be used according to the following: The faculty will be represented by F1, F2, F3, and F4, the IT staff will be represented by T1, T2, and T3 and the library staff will be represented by L1, L2, L3, L4, L5 and L6.

DISCUSSION

The following section presents a synthesis of the results, classified according to the research questions.

Who uses ICT in this university and for what purposes?

According to the interviews with academic administrators at the university, most of the faculty, teachers, secretaries, staff, use ICT. Most of them use it for data storage, data retrieval, data sorting, queries, data gathering and printing. One of the chairpersons stated that technology is embedded in every function they do. Another chairperson added that 10% to 15% of the department faculty use technology in teaching and 100% use it in research.

As to the teachers, the questionnaires revealed that some of them stated that they are not obliged to use technology in their teaching, but they use it only for research. Teachers who use technology in their teaching use Webct and e-reserve to post exams and syllabi, and to send updates and notes to students. In addition, they use Turnitin, Blue system, Spss and smart classes.

However, as one Assistant Dean said, Oracle financial is open for the administration only, while the Banner system is available to everybody. As to students' use of technology, interviews showed that every student has to use the Blue system to fill out the course evaluation on-line and to view the results. Students have also to type their assignments and hand the printout or send the electronic file. According to a professor, "a student cannot graduate from the university without being familiar with technology". (F1)

The analysis of the questionnaire showed that 55% of the respondent professors use ICT in their classes.

In the Business School, 75% of the faculty agreed that they use ICT to communicate with students and colleagues, and to keep and manage students' records. 80% of them use ICT as a search engine for research and publications, and 85% to select books from the library. 90% of them use ICT to manage instruction, and 95% to find new ideas and techniques for their teaching and to exchange ideas, articles and information with colleagues. However, only 45% of the teachers use ICT for students' advising and registration (Appendix 1, Table 1 & 2).

In the School of Arts & Sciences, 70% of the respondent faculty agreed that they use ICT to communicate with students and colleagues, and 85% use ICT to keep and manage students' records. All teachers in SAS use ICT as a search engine for research and publication and 75% use it to select books from the library. 85% to 95% use ICT to manage instruction and to find new ideas and techniques for teaching, and to exchange articles, information and ideas among colleagues. As to the use of ICT for students' advising and registration, it is declared by 80% of the respondent SAS faculty (Appendix 1, Table 1 & 2).

According to the library staff and director, all of the university community uses technology in the library, for their daily work. The staff use technology to run the work flow of the library, the students, the alumni and the part time faculty, use all kinds of technology that the library provide them with, such as the internet, Microsoft office to do homework and research. However, the alumni should have an ID and a subscription to be

able to use the library. The library staff agreed that with the new technology used, the workflow is much easier than before because ICT allows them access to all resources. The university library has a counter that tells how many persons access the library on a daily basis.

Around 1500 to 1700 students access the library and use the computers everyday. This number represents around one fourth of the total number of full time students enrolled on campus.

According to the library Director, “we subscribe to several on-line databases, we add to our subscription Open Access resource technology, that has refereed material, for free. It is already evaluated to be very good for research. Also we have all kinds of services that we also provide to students, such as scanning, printing, black-and-white photocopy, and the library system is accessible for any users, even the public can access the library, both Beirut and Byblos. We have the e-reserve, a very successful technology. Faculty use it most. This is one part of the library where the staff, faculty and students are integrated. We try to work with technology to integrate students, staff and faculty. And the IT they are behind the scene; they always help us and provide maintenance”

The library has conducted its own statistical study to see how many students use each database, and if a database is not being used they eliminate it. Through technology, they can access which student, with his or her ID number, and in which major, use a specific database. As to the borrowing circulation, they can check how many books were borrowed by the Business school students or Education students, as an example. It was noted that many students don't borrow books from the library, they only use the Internet.

The library is very well equipped with technology. It has the OLIB system for course cataloguing and it has subscription for external databases like the Library Of Congress. The OLIB system is accessible from any place in the world. On-line databases are used to connect with the outside world and to enhance collaboration between universities.

The library Director stated that they found a solution for students who don't find a place on the computer. The library has acquired 10 laptops that students may borrow for on-site work.

However, some students and faculty rarely visit the library for research, because everything is on-line. They can renew a book and access for information from home. The library staff is convinced that they have to attract more students to visit the library, so they are going to change the policy in the library, like adding new snack and drinks machines, to make them feel at ease. According to a library staff member, "If the cup of coffee fell on the keyboard we will change the keyboard. We had to do the impossible to attract our students."

According to the IT staff and Vice-President, all faculty, students, staff and alumni use ICT at LAU. The purpose of using ICT at the university is to enhance the teaching and learning process and to facilitate the communication and collaboration among students, faculty and the different offices and to share information between classes at LAU and abroad, through the wireless connection.

Teachers use various software for teaching like mathematical and statistical software, and the WebCT/ BlackBoard for course management. They use non-software technology "like scanners, projectors, multimedia" (T1) and "we want to implement 52

smart classrooms, i.e., projectors, controls, screens, document imaging camera, sound systems, video conferencing.” The IT plan is to create smart classrooms and to equip faculty with a proximity card allowing them to put the system on for use. “Everything will automatically turn on, like computers and an interactive smart board”(T1). Teachers use projectors, videoconferencing, audio conferencing, telephoning, Internet, multimedia, e-mail, and many other applications. Students use ICT to register their courses and to follow on payment and class schedules.

What are the major learning and/or teaching uses of ICT?

The faculty state that they use technology to improve teaching and learning. According to a professor in the Business School, “we are not a school of computer programming or computer software, we use the software to improve the quality of life on the job, but we do not develop software.” When a new software emerges in the market, the school buys it and uses it in its courses to improve learning and teaching.

Some classes have fixed cameras, projectors and PCs and, according to one of the professors, “Powerpoint is used for secondary material”; The Internet is also used in real time in both schools’ classes. “when I talk about a cathedral in class, the students can open the Internet, and see the actual cathedral”. (F3)

WebCT is a major tool that is used for course management, and for posting grades, notes, slides and to make any course material available on-line for students. Moreover, Turnitin is used for identifying and preventing plagiarism, “it is a system that catches plagiarism, we are using this system for thesis and project, we are looking to expand to be able to use it for the class work. Students are not allowed to cut and paste

from other resources.”(F4) Deans are encouraging their teachers to put material on-line, and they carry out workshops to update the faculty on these systems.

In the Accounting Department, all the students use technology and have compulsory electronic assignments. They go to the Business Computer Lab to work on their electronic assignment. According to a professor, “in the area of Hospitality, the Computer Lab has a special software, Oprah, for special hotel reservation system, and it is used to simulate real life reservation, on-line check-in, out, and room status.” Teachers believe that they are very close to technology and they stay updated all the time. They make demonstrations of the software in class and then students apply and practise in the lab.

On-line course evaluation system is accessible by students. They are asked to fill an evaluation form for each course they are taking. The results are immediately tabulated to be sent to the School Dean who forwards them to Department Chairs and then concerned faculty. ICT is also used for meetings, “some of our meetings are via technology, we do videoconferences, phone conferences, we share information overseas, we e-mail papers to be revised and checked. It has made our life simpler”. (F1) According to another professor, communication became easier with e-mail and collaboration with other faculty members abroad. “We send them proposals to evaluate and to share research, in writing journal articles”. (F4)

Teachers are not obliged to use technology but they all are encouraged to do so. Some of them use overhead projectors and PowerPoint software. In one Communication Arts course, a faculty member stated: “we have to use technology. We videotape on DVD

the students and then they see themselves how they speak, they see their own performance”.(F3)

The library always tries to be up-to-date with technology. The Director emphasizes the fact that they try to offer everything that is in relation with technology to facilitate work. The first system that was incorporated in the library was the Opac system, on-line public access. It is the library catalogue. According to library staff: “Before, we used to have all information in drawers, everything was classified by author, by subject and title.” With the new technology, everything is scanned and input in the system.

The z-portal was introduced to connect with different libraries abroad. The reserve was the solution for students, teachers and the library staff, “A thousand course files from all departments, notes, and chapters are included in the reserve. Students used to borrow and photocopy them. It took too much time photocopying and sometimes the photocopy machine broke, so students cannot photocopy anymore”.(L1) Now with the new technology, everything is on line, classified in folders. In addition, “there is now respect for the copyright of the chapters. Before we use to photocopy all the chapters, now one at a time, and we have to abide by the rules and regulations.”(L5)

The library has black and white, and colored printers, scanners, computers, Microsoft and Internet. In addition, the library has now newer cataloguing and circulation system, the Olib system. For circulation, cataloguing, Inter-Library Loan, Olib is used.

The wireless connection plays an important role in the library. Many students use their own laptops in the library, and due to the wireless connection, they are able to work on-line. The photocopy machines are also wireless.

The Webview system is used by students to borrow books, “students do not wait anymore for us to write on papers and cards, now we scan the bar code of the book, and the student’s ID number, and the job is finished.”(L5)

The Databases are used to search for resources and references on-line. The library has acquired subscription to approximately 80 databases, some of which providing access to full papers and others to abstracts only; “you take the abstract to the document delivery, and they will get the article” (L5)

According to the IT staff, ICT is a tool to enhance teaching and learning, using all its aspects, including networking, multimedia, telecommunication, software, hardware and services, “In academia to enhance teaching and learning, ICT is a tool to teach”(T1) Students use ICT to learn and to communicate with each other, with the faculty and with all the university constituents, “If a student requires a document from the registrar, they use ICT to request the document, to check fees, grades, class schedule, etc.” (T1). ICT facilitates the work flow of students. They use the WebCT, which is a supplement to the courses, where students find their class material, homework and tests on-line.

The use of ICT in the university enhances collaboration between universities’ libraries through the use of on-line databases and z-portal. The library portal is a search engine that allows students and faculty to retrieve information, in less time, from several databases and to stay in contact with different libraries. With the use of the Olib system, students and faculty can access the library from any place in the world and they can check “what books and materials they have in the library, and they can manage their work remotely and students can download books from other libraries” (T3).

According to the questionnaire, the results show that 85% of the teachers in the Schools of Arts & Sciences and Business agreed that registration on line is faster and less time consuming and 95% agreed that ICT helps them finding good teaching material for students. However, only 50% to 60% of the teachers agreed that their teaching methods changed to the better, that their students are more involved in class activities, that ICT increased their students' interest and attention and that it gave them more time to do publications. Finally, 80% to 85% of teachers from both schools agreed that ICT enhances more accurate results for students' records and averages (Appendix 1, Table 3).

How did the use of ICT change teachers' and librarians' working modes?

According to all the academic administrators, the availability of technology made their work easier and simpler, "It is a blessing, we cannot live without it. I am delighted that the school made it available for us" (F1). Instead of preparing each time a lesson, teachers just have to prepare the Powerpoint presentation once.

Teachers use technology and the online databases available in the library for research. "As far as LAU commitment to technology, they are doing a good job".(F1) Another teacher believes that it saves time to search in the database and to order material form the library on-line.

Technology helps a lot, especially smart classrooms, according to teachers. They type notes on the board and the students will download them without copying them. Finally technology allows teachers to have more time and more tools to do research. According to a professor, if someone needs to conduct a survey among students, faculty and staff, he or she can create the survey on the Blue system, and give it back to students,

faculty and staff to fill it out. This survey will be automatically tabulated. Prior to this, it was done manually and took too long to be processed.

The results of the questionnaire show that 90% to 95% of the teachers at the School of Business agreed that the class preparation is more efficient when they use ICT, that ICT gave them more time to do research and collect more up-to-date information and helped them finding good teaching material for their students. 55% of the School of Arts & Sciences teachers agreed that the class preparation is more efficient when they use ICT, 95% agreed that ICT gave them more time to do research, and 85% agreed that ICT helped them finding good teaching material for their students. On the other hand, 80% of the teachers in School of Arts & Sciences agreed that ICT kept them in touch with different universities in Lebanon and abroad, whereas 60% of the teachers in the School of Business agreed that ICT kept them in touch with different universities (Appendix 1, Table 4).

According to the library staff, ICT creates a connection between students and their teachers, “before we had the reserve, teachers used to give us physically the material, we used to shelve them, and the students had to come physically to the library to get them. The student should have an ID to get the material, make photocopy of what they need, and bring them back for the others to use them.” Now no restriction, everything is on-line. It is open for the students. However, when the library staff started the e-reserve, “90% of the teachers did not accept at the beginning the idea of e-reserve, because before, they were more relaxed; they used to send a complete file to the library and the library staff would photocopy it. The teacher did not have to ask about it anymore. The next year, the teacher will tell us to keep the same file on the reserve shelf.

Now teachers have to work more, because they have a specific form to fill, they have to include the author name of the book and the chapter, year, then teachers noticed that these chapters can be archived, so the next semester, they may ask on the phone for the materials to be open again. (L5)

The course management system facilitates the teachers' working modes. Through the use of WebCT and the BlackBoard, teachers can post their quizzes, schedule and notes on-line. Students don't need to be physically in class to take the test. Information technology made a lot of changes in teaching and learning where course preparation became faster, and enhanced collaboration between students and teachers.

Technology changed the students' life style. The present Library Director's aim is now to encourage students to visit the library to study and relax, and students may "work together as a team"(L1). The Director believes that technology made them change the concept of the library use and they are trying to change the policies of the library. Finally, technology obliged teachers and students to do research and because of technology, the expectations in teaching and learning are higher than before.

Technology changed the working modes of teachers because now they can access the library catalogue, e-reserve, webCT and databases from their offices or from home and if they need a book they order it on-line.

The library staff believes that they do not have less work but a different kind of work and "With technology our work tripled, because it is more demanding and the students' demands are growing". (L3)

Before the implementation of technology in the library everything was done manually, with a lot of mistakes and no quality control, "when it was manual, a book

needed 3 months to be ordered, acquired, shelved, then made accessible by the user. If it is a technology book, after 3 months it would be outdated”. (L1). Now when the book arrives, it needs only one month and the end user knows automatically that it will arrive soon.

When the University made the decision of heavily using technology, the library staff thought that with automation there will no longer be needed and that they might lose their job. However, according to the library director, the library needs more staff than before, because “we now have a department for quality control; we need more qualified employees, because the system is the university visibility to the world”(L1) and if any mistakes are committed on-line, people outside will see it.

In the Acquisition Department, work has become faster and easier “now one key touch” (L2), and no more manual cards checking. The “Global Book In Print” is online and it “checks the full bibliographic information about the author of a book, and the price, title, name and the year of inception”. (L2)

According to the Cataloguing Department staff, technology is challenging, refreshing, and makes the job beautiful. According to the Circulation Department it was a dream come true, “before it was very difficult, no more filing, stamps, papers, before we had to have files for the students, books, and every Saturday we used to stay in the library to do filing, and manually put charges for every late student.”(L4) Before, many reserves used to get lost but now everything is in order. The new system is customized according to the library needs.

According to the Inter-Library Loan (ILL) staff, ordering books take less time, “Books still come by mail, but to find the book it takes less time. Before, we used to

work only with the British Library, and if the British Library does not have the book, we did not have a way bring the book. Now with the OCLC, all the libraries in all universities tell you where is the book. They give us an automatic answer if they are going to give us the book or not”.(L6)

What obstacles are faced, if any?

The IT staff attests that they have always faced constraints. They have ideas and plans, they want to do many things at the same time, but the budget is limited, “we want to do so much but not enough budget”.(T2)

The human resources within the IT department is not enough and the university is so overwhelmed with projects that employees don’t have time to work with the IT project.

On the other hand, the IT department faced resistance from the older generation because they are not used to the new technology, but “in few cases they were interested in tech, even if close to retirement”. Some faculty don’t want to use the WebCT, and others don’t want to use projectors in their classes. However, these people have to change their working modes “to catch up with the 20th century, with the NEAS requirements and with students’ needs”. (T3)

Another important constraint is the issue of data security: who has the right to access and to make any modification to a certain set of data? and who has the right to see specific information?

Moreover telecommunication regulation is restricted, “we have limited wireless and IP telephoning, we need license and we need more training”. (T2)

The results of the questionnaire show that only 15% of the respondent faculty in the Schools of Business and Arts & Sciences, agree that the use of ICT in class is distracting students, which implies that ICT actually has a good impact on students, and is not an obstacle (Appendix 1, Table 5).

In which direction is the use of ICT at LAU evolving?

According to the library Director, “information and communication never stop, they are always evolving.” On a daily basis there is something new in technology; “we cannot close our eyes, and say we do not need them and we cannot wait because technology is running very fast, and always new things are happening around”.(L1)

Another library staff member agreed that the use of ICT is growing very fast, “ICT is the core of the library and it is a “state of the art” where we always improve and compete in the Middle East.

In the cataloguing department, the use of ICT is always growing because the software that they have just bought will immediately have a new version.

Because the number of students is growing in the university, the library has to evolve in a way to meet students’ needs and expectations. More laptops will be available with more technology, “students will have a small calculator in their hand, wherein they enter the bar code and will start to search for the book through passing the machine over the books until they find it. This will make the work of the students faster and more efficient”(L4).

A self-service technique will be applied whereby “the students will take the book from the stack, and they will have a machine next to them, they will check out the book and take it home with them”(L5)

ICT will remain evolving and the aim is to have a unified catalogue with many universities, “American University of Beirut, American University of Paris, of Bulgaria, etc, without paying money, and we will exchange books.” (L5).

Because technology is always growing, new kinds of employment and qualifications are required. Libraries need computer literate employees and technology is creating new kinds of jobs, so the number of staff does not decrease.

According to the IT staff, “we are updating our computers and communication system on yearly basis”. They have a five-year capital plan in order to provide to students and faculty the most up-to-date technology and a safe security system in order to control intruders, viruses and spyware.

Technology is not a luxury but a necessity for all users, and the IT staff tries to stay on top of technology to serve the university community “the university is the first campus in the middle east that has a full wireless connection.”(T1)

While advancing, the plans of the IT department evolve around the needs and requirements of the students, faculty and staff. The IT team members aim for excellence in education and “to be the best university”. (T2)

In addition, the IT staff is focusing on smart classrooms where the plan is to have 85 classrooms converted into smart classrooms. This includes presentation, multimedia, video conferencing, sound systems and interactive tools. When the faculty members want to access the classroom they only need an access card. When they check in, everything is on, and “the set up of the classroom is ready for the presentation, like the sounds, lighting, screens and booting the computer”. (T2)

One important field now is the IT for the medical school. The medical school will be equipped with the latest technology, in terms of infrastructure, wireless network, multimedia, smart rooms, etc. There will also be simulation centers that IT will support. It will be possible to record doctors practicing on patients or on human patient simulators (mannequins) that are controlled by computers. These recordings will be valuable tools for medical students' practice, learning and self-evaluation. "We will have software for the medical school, virtual microscopy, and medical dictionaries. The medical school will take a lot of IT resources, infrastructure, applications, networking, multimedia".(T1)

To stay up to date with evolving technology, managers and dispensers of IT applications get training, sometimes outside the university, and sometimes consultants come to the university to train them, "When we implemented the Banner student information system, a team from Sungard came and trained people and sometimes IT administrators and staff go abroad and get trained." (T1)

The additional professional development that the IT staff will do is more training programs for all at all levels "from basic skills to more advanced level". (T1)
Within IT, they yearly have training, "each one within his field of specialty". (T1)

Moreover, computers are updated regularly, "the computers are updated on 2 cycles, for heavy users of computers every 3 years, for less heavy users every 4 years. By update I mean replacing the computer." (T1)

Software are also updated continually, "we have an academic license agreement with Microsoft, we update ourselves with their support. A lot of update can be done remotely, or the support team will dispatch people to make the updates. (T1)

What is the role of the IT Department in fostering ICT use in the university?

The IT department plays a crucial role in developing ICT use in the university. Teachers are in constant relation with the IT department for purchasing software and hardware, updates, printing rights, electronic abuse, troubleshooting with the computers and printers. If teachers want to buy laptops for their departments, they have to get the approval of the IT department.

The HelpDesk is a great success, according to a teacher, and “within one day we get the service done, the folks are doing a great job.” Upon request, the IT department sends an expert to fix the problem or to follow up. However, one teacher suggested that the IT department needs more employees.

According to a Department Chair, the Business School is well equipped with ICT tools, “We think that teachers in the Business School should not complain about technology, those who complain are not using technology, because the school is well equipped, we have smart classrooms, most of our classrooms are equipped with modern technology and the IT department is taking good care of us.”. A well equipped school empowers students to be friendly with technology and to take it with them whenever they leave to find new jobs.

However, another department head complained that it takes so long for the IT department to order new material. He complained that the department has only two laptops and two digital cameras and that “the part time offices need more technology, however the full time ones have enough.” (F4)

The IT department plays an important role in promoting ICT use in the library. In the year 2000 modern technology was implemented in the library and the Olib system

was started. The library moved from total manual to total automated work flow, and all staff members attended training sessions, “they came from abroad, the dealers, and trained us, I was trained and some others from the IT department were trained, then we trained others” (L1) . Nowadays, training is done on line, through videos or meeting on line “they don’t need to come anymore to train us” (L1)

The library staff have a good relation with the IT department; “without it we cannot work and the budgets and software come from the IT department. The person from IT is my backup.”(L1).

The Acquisition Department does not deal directly with the IT department but “we have the system librarian and the computer center supervisor, he is the liaison between the library and the IT”.(L2)

The Cataloguing Department also deals with IT department but through the computer center supervisor “we file our request, about all the technicalities and the hardware; but for the software, we have to go through the system librarian, she contacts the application manager in the IT dept” (L4).

The Circulation Department also relies on the computer center supervisor “he helps us in everything; sometimes we do not need the IT, only in software, main frames and databases. The library and IT are always winners in the accreditation. We work together. We have accreditation for the library.(L5) He suggested to have an IT department in the library because “we are large”.

According to the library Director, the IT staff have a lot of work but they are understaffed.

The IT department has to provide all the systems, maintenance and support for all the university. “The IT service is good “because the liaison is good” in acquisition and especially in software, maintenance, correction, request.”(L4)

The computer center supervisor assures that the IT service is excellent and they are very quick in responding to their demands, but they are also understaffed.

The library staff believes that they have enough IT tools and materials to be used. Every year they add something new “we are adding PCs in every floor, 12 PCs in every floor”. (L1). Moreover, the tools that are not available in one office can be found in another. “Yes, we have enough tools and we are very lucky (L3),we have enough and the latest” (L4) and “we have better technology than Europe because we have a good budget, leadership, director, staff. Outside you do not find in every office a computer and a printer, usually one area that has computers and printer. Here we have everything, it is the state of the art”.(L5)

The IT department has several roles in fostering ICT use in the university. According to one IT staff the majority of the teachers and librarians are not well trained to use and apply technology at work, “A survey was sent to asses the computer skills at the university, and we found out that they vary. Some people are well equipped and some are not.”

In its strategic plan the university agreed for a training program provided by the IT department “IT will be working with the academic affairs, students affairs, staff, to implement training programs for all in order to enhance computer skills, basic skills, and more advanced like Word, Excel, Powerpoint and more specialized applications such as

the university Banner, student information system, fund raising system, library system and others.” (T1)

The IT Director believes that librarians are very well trained and that teachers have beautiful software for anti-plagiarism. He affirms that the IT staff do the training, “we do the training, and each application has a person responsible for its development and training. For the library system we have a person responsible for it, when we implement it, we ask the librarians what they need, we choose the system together, fitting their need. After finishing the implementation we do the training for them”. Also, the IT department is responsible for the updates of the computers at the university.

One of the IT staff confirms that the computers are updated on two cycles. Every three years for heavy users of computers and every four years for less heavy users, “by update I mean replacing the computer.” For software update, they do it continually, “we have an academic license agreement with Microsoft; On a yearly basis, we update ourselves when we feel the current settings are not supporting us, or not stable, sometimes we have a request from faculty to update”.(T1)

He added that a lot of updates can be done remotely, otherwise the IT support team will dispatch people to update. For some updates, like anti-virus software, they do not need to inform users, because the system makes the update automatically.

The additional professional development or support that the IT department needs to implement ICT more effectively is training programs, “more training programs at all levels, from basic skills to more advanced levels and we need to organize more workshops to train people.”(T1)

The IT staff believes that it is very important to keep IT up to date in using the system, so they have yearly training, each within their own field of specialty, network people go for network training, security people go for security training program.

Some of the faculty members ask for basic support like fixing the computer or laptop, or with Excel, or a projector in class. Other faculty need help with the WebCT, with the library system, and with any software that the university provides for them. One IT staff added that “we have just implemented the course evaluation system, so students need help with it. Some of them need support and reporting”.(T1) Another IT staff added that “when teachers want to use anti-plagiarism system and they don’t know, they ask for training”.

One IT staff believes that the support that faculty members ask for is also training, “we have telephone, computer, the wireless coverage, cabling of the network, every data connection in the office including wireless or cabling and the IP phone and the computer. If the faculty member has a printer, fax, scanner we support it all.”(T3)

He added that they have a professional way to handle the call for support, it is the HelpDesk. If a problem occurs, faculty or staff may call 1000 and the call will be logged in. The IT staff will open a ticket immediately and they respond to the case within two hours.

Regarding the support that librarians ask for, one IT staff confirms that they need it on the existing system “Like the library system, the e-reserve system, the zportal and they also require more help in archiving” and “as much as we can afford we try to help them”. (T3)

Moreover librarians ask for new developments and reports, “we develop new reports they ask for”, according to the T3.

According to the questionnaire, the results show that 45% of the teachers at the Business School agreed that they were well trained to use ICT and 60% are aware of most updated ICT tools, whereas only 25% of the School of Arts & Sciences teachers agreed that they were trained, and that they are aware of most updated ICT tools and packages. 60% to 70% of the teachers in both schools deal frequently with the IT department for technology related matters. 75% of the teachers in the School of Business and Arts & Sciences agreed that they have enough IT tools in their classes and offices. Finally 75% of the Business School teachers are satisfied with the IT services in their departments, whereas 55% of teachers from the School of Arts & Sciences are satisfied with IT services. Teachers from both schools need more training and support from the IT department. Teachers need to be informed about, and aware of most ICT updates done by the IT department so they would know what version of software they need to use (Appendix 1, Table 6).

CONCLUSION

ICT is a major tool that is invading our world and especially universities. The study reveals that most of the faculty, teachers, librarians, secretaries, staff, use ICT in their daily work. Most of them use it for data storage, data retrieval, data sorting, queries and data gathering. In addition, most of the teachers and librarians use ICT to communicate with students and colleagues, to keep and manage students' records, to find new ideas and techniques for their teaching and to exchange ideas, articles and information with colleagues and to select books from the library and as search tool for research and publications. The WebCT, Turnitin, e-reserve, PowerPoint software, phone conferences, e-mails, OPAC, Z-portal, Webview, wireless connection and many other applications are used in the university to enhance and facilitate learning and teaching, and to open doors with other universities abroad. Similarly, the use of ICT is changing the teachers' and librarians' working mode to the better. It gave teachers and librarians more time to do research and publications. Moreover, course preparation became faster and enhanced collaboration between students and teachers. The library now has different kinds of job available and more qualified employees are needed to meet the evolving "state of the art" library needs.

One of the obstacles that the IT department faced was the resistance to change from elderly teachers. Other obstacles were budget limitations, shortage of IT staff, and data security issues.

The role that the IT department is playing in fostering ICT use in the university is very important. The IT department provides all the systems, maintenance and support for all the university. In addition, they provide training programs for all in order to enhance

computer skills, and more specialized applications like the university banners, student information system, fund raising system, library system and others. The university network enhances and maintains immediate communication with many people and quick access to libraries and other sources.

The use of technology is evolving positively and very fast in the Lebanese American University. On a daily basis there is something new in technology and the university always tries to stay up to date with information and communication technology.

Limitation of the study

It is important to acknowledge that this is a small-scale study at LAU. It focuses solely on two schools, SAS and SB and the library in Beirut campus only. Thus the results of this study cannot be generalized because one university in Lebanon is not representative of all universities and two schools on one campus at LAU are not representative of all LAU schools. However, this research work will encourage more inquiry into the subject. Other researchers can build on the results for further investigation.

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APPENDIX A

Tables Summarizing Participants' Answers to Questionnaire Items

Table 1
Who uses ICT in the university?

	Business School N=20			Arts & Sciences N=20			Total N= 40		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
I always use ICT in my class	55%	10.00%	35.00%	55%	15%	30%	55%	12.50%	32.50%

Table 2
For what purposes?

	Business School N=20			Arts & Sciences N=20			Total N= 40		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
I use ICT to communicate with students and colleagues	75%	15%	10%	70%	30%	0%	72.50%	22.50%	5%
I use ICT to communicate with the administration of the university	85%	15%	0%	80%	10%	10%	82.50%	12.50%	5%
I use ICT as a search engine for my research and publications	85%	15%	0%	100%	0%	0%	92.50%	7.50%	0%
I use ICT in my class to manage instruction	90%	10%	0%	85%	5%	10%	87.50%	7.50%	5%
I use ICT in my class as tutorial software	50%	25%	25%	45%	25%	30%	47.50%	25%	27.50%
I use ICT in my class for demonstrations	80%	10%	10%	75%	15%	10%	77.50%	12.50%	10%
I use ICT in my class for students' presentations	85%	5%	10%	90%	5%	5%	87.50%	5%	7.50%
I use ICT to find new ideas and techniques for my teaching	95%	5%	0%	95%	5%	0%	95%	5%	0%
I use ICT to exchange articles, information or ideas with my colleagues	90%	0%	10%	95%	5%	0%	92.50%	2.50%	5%
I use ICT to keep and manage students' records	75%	20%	5%	85%	10%	5%	80%	15%	5%
I use ICT for storage of information	85%	15%	0%	85%	10%	5%	85%	12.50%	2.50%
I use ICT for students' advising and registration	45%	50%	5%	80%	20%	0%	62.50%	35%	2.50%
I use ICT to select books from the library	80%	10%	10%	75%	20%	5%	77.50%	15%	7.50%
The use of PowerPoint improved my teaching	80%	5%	15%	55%	25%	20%	67.50%	15%	17.50%
The use of PowerPoint improved student learning	75%	5%	20%	60%	20%	20%	67.50%	12.50%	20%

Table 3

What are the major learning and or teaching uses of ICT

	Business School N=20			Arts & Sciences N=20			Total N= 40		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
My lessons are better understood by my students if I use ICT.	65%	25%	10%	70%	25%	5%	62.50%	20%	17.50%
My students are more motivated to present their homework in class using ICT tools	65%	30%	5%	70%	20%	10%	67.50%	25%	7.50%
My teaching methods changed to the better when I used ICT	60%	40%	0	60%	25%	15%	60%	32.50%	7.50%
When I use ICT, my students are more involved in class activities	55%	20%	25%	45%	40%	15%	50%	30%	20%
ICT increases my students interest and attention in class	50%	35%	15%	50%	35%	15%	50%	35%	15%
The types of assignments are more diversified when I use ICT	60%	30%	10%	75%	15%	10%	67.50%	22.50%	10%
Registration on line is faster and less time consuming	95%	5%	0	85%	15%	0	90%	10%	0
The use of ICT fosters better communication with my students	70%	30%	0	70%	30%	0	70%	30%	0
The use of ICT fosters better communication with my colleagues	70%	30%	0	85%	15%	0	77.50%	22.50%	0
ICT enhances more accurate results for students records and averages	85%	15%	0	80%	20%	0	82.50%	17.50%	0
ICT helps me finding good teaching material for my students	95%	5%	0	85%	15%	0	90%	10%	0
ICT gave me more time to do publications	55%	40%	5%	60%	40%	0	57.50%	40%	2.50%
Through ICT, I keep in touch with different universities in Lebanon and abroad	60%	35%	5%	80%	20%	0	70%	27.50%	2.50%

Table 4

How did the use of ICT change teachers' working modes?

	Business School N=20			Arts & Sciences N=20			Total N= 40		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
My preparation for my class is more efficient when I use ICT	90%	5%	5%	55%	25%	15%	72.50%	15%	12.50%
My teaching methods changed to the better when I used ICT.	60%	40%	0	60%	25%	15%	60%	32.50%	7.50%
ICT gave me more time to do research and collect more and up to date information	95%	5%	0	95%	5%	0	95%	5%	0
ICT helps me finding good teaching material for my students.	95%	5%	0	85%	15%	0	90%	10%	0
ICT gave me more time to do publications.	55%	40%	5%	60%	40%	0	57.50%	40%	2.50%
Through ICT, I keep in touch with different universities in Lebanon and abroad	60%	35%	5%	80%	20%	0	70%	27.50%	2.50%
I frequently deal with the IT department for technology-related matters.	60%	30%	10%	70%	15%	15%	0.65%	22.50%	12.50%
I use ICT to select books from the library.	80%	10%	10%	75%	20%	5%	77.50%	15%	7.50%

Table 5

What obstacles are faced, if any?

	Business School N=20			Arts & Sciences N=20			Total N= 40		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
I prefer the old teaching methods.	10%	15%	75%	5%	30%	65%	30%	47.50%	22.50%
The use of ICT in class is distracting my students.	15%	10%	75%	15%	30%	55%	15%	20%	55%
I don't use ICT in my class	5%	20%	75%	15%	5%	80%	10%	12.50%	50%
The use of ICT is not making any difference in my teaching	5%	15%	80%	20%	15%	65%	12.50%	15%	72.50%

Table 6

What is the role of the IT Department in fostering ICT
in the university?

	Business School N=20			Arts & Sciences N=20			Total N= 40		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
I was well trained to use ICT equipments and packages	45%	30%	25%	25%	35%	40%	35%	32.50%	27.50%
I know how to fix my computer if it is blocked.	20%	30%	50%	30%	30%	40%	25%	30%	45%
I am aware of most updated ICT tools and packages	60%	25%	15%	25%	55%	20%	42.50%	40%	17.50%
I frequently deal with the IT department for technology related matters	60%	30%	10%	70%	15%	15%	65%	22.50%	12.50%
I am satisfied with the IT service in my department.	75%	15%	10%	55%	35%	10%	65%	25%	10%
I have enough IT tools in my class.	80%	20%	0%	60%	15%	25%	70%	17.50%	12.50%
my office is well equipped with ICT tools	70%	20%	10%	75%	15%	10%	72.50%	17.50%	10%

APPENDIX B

ICT: Information and Communication Technology

School:

Department:

	Teachers	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	I use ICT in my class to manage instruction					
2	I use ICT in my class as tutorial software					
3	I use ICT in my class for demonstrations					
4	I use ICT in my class for students' presentations					
5	I always use ICT in my classes					
6	My classroom is well equipped with ICT tools					
7	I use ICT outside my class to communicate with students and colleagues					
8	I use ICT outside my class to communicate with the administration of the university					
9	I use ICT as a search engine for my research and publications					
10	I use ICT to find new ideas and techniques for my teaching.					
11	I use ICT to exchange articles, information or ideas with my colleagues					
12	I use ICT to keep and manage students' records					
13	I use ICT for storage of information					
14	I use ICT for students' advising and registration					
15	The use of PowerPoint improved my teaching					
16	The use of PowerPoint improved student learning					
17	I use ICT to select books from the library					
18	My office is well equipped with ICT tools					
19	My lessons are better understood by my students if I use ICT.					
20	My preparation for my class is more efficient when I use ICT					
21	My students are more motivated to present their homework in class, using ICT tools.					

	Teachers	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
22	My teaching methods changed to the better when I used ICT					
23	When I use ICT, my students are more involved in class activities					
24	ICT increases my students interest and attention in class					
25	The types of assignments are more diversified when I use ICT					
26	Registration on line is faster and less time consuming					
27	The use of ICT fosters better communication with my students					
28	The use of ICT fosters better communication with my colleagues					
29	ICT enhances more accurate results for students records and averages					
30	ICT gave me more time to do research and collect more and up to date information					
31	ICT helps me finding good teaching material for my students					
32	ICT gave me more time to do publications					
33	Through ICT, I keep in touch with different universities in Lebanon and abroad					
34	I was well trained to use ICT equipments and packages					
35	I know how to fix my computer if it is blocked					
36	I prefer the old teaching methods					
37	I am aware of most updated ICT tools and packages					
38	I frequently deal with the IT department for technology-related matters					
39	I am satisfied with the IT service in my department.					
40	I have enough IT tools to use in my classes					
41	The use of ICT is not making any differences in my teaching					
42	The use of ICT in class is distracting students					
43	I don't use ICT in my teaching					

The main common ICT tools programs I use are:

<input type="checkbox"/> WebCt	<input type="checkbox"/> Microsoft Word
<input type="checkbox"/> Banner	<input type="checkbox"/> Excel
<input type="checkbox"/> Turnitin	<input type="checkbox"/> PowerPoint
<input type="checkbox"/> Olib (Library)	<input type="checkbox"/> Access
<input type="checkbox"/> E-mail	<input type="checkbox"/> SPSS
<input type="checkbox"/> Video conferencing	<input type="checkbox"/> E-reserve

I use ICT tools (programs) specialized for my teaching which are software in subject matter I teach:

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