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ATTITUDES TOWARDS E-LEARNING SYSTEMS IN A CONVENTIONAL TEACHING-LEARNING ENIRONMENT IN TUNISIA COLLEGES AND UNIERSITIES

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ABSTRACT

This paper aims to examine learners' and instructor's attitudes towards e-learning systems in a conventional teaching-learning environment, focusing on a few higher education institutes operating under the approval of the Tunisia Ministry of Higher Education. The primary data was collected through pre-interview questionnaire. The findings revealed that based on the survey data generated from 66 instructors and 96 students, there is a high level of willingness to adopt e-learning systems in conventional teaching-learning environments like colleges and universities. High levels of association are found between the perceived quality of e-learning systems and their adoptability in the conventional teaching learning environments in the Tunisia. The usable is restively small. This study opens up an avenue for discussing the implications and possible

adoption of e-learning systems in the conventional teaching-learning setting currently employed in the Tunisia.

Introduction

The new millennium has emphasized the vital role of information technology and telecommunications in business development. The past decade has witnessed spectacular improvements in the computational capabilities of calculators and computers and, more recently, thrilling advances in their communication capabilities. The marriage of these two functions—computation and communication—has produced powerful information technology tools that have important implications for education. IT, and within this broader designation, its educational, instructional, and learning technology applications, facilitate collaboration, interactive learning, and new pedagogical approaches that can lead to changes in the way student and faculty interact. The rapid pace of change in information technology increasingly impacts the creation, publication, and dissemination of educational materials. Regardless of the rapidity or direction of change offered by revolutionary new technologies, the true challenge for developing guiding principles for their appropriate implementation lies in the involvement of all students at all types of academic institutions, with secure and tangible links to the public and private sectors. Personal attitudes play a major factor in individual use of information technology, so understanding users' attitudes toward electronic learning facilitates the creation of appropriate electronic learning environments for teaching and learning as in new technology. However, methods of assessing electronic learning may be hard to evaluate using a single linear methodology, so there is a need to build a multidisciplinary approach in order to survey individual attitudes toward electronic learning (Liaw, 2000; Liaw, 2003). The measurement of e-learning systems must incorporate different aspects of user perceptions to form a useful diagnostic instrument (Wang, 2003). In addition, from the point of view of Liaw (2000), constructing user attitudes toward computer and Internet technologies can be divided into three major kinds of measurements: affective, cognitive, and behavioral. Affective measurements (such as perceived enjoyment) and cognitive measurements (such as perceived usefulness) have a positive effect on behavioral measurements, such as the intention to use e-learning as a teaching or learning tool (Liaw, 2003). The past decade has witnessed spectacular improvements in the computational capabilities of calculators and computers, and more recently, inspiring advances in their communication capabilities. Even Tunisia has committed to the institutionalization of ICT (Information and Communication Technology) in all aspects of the economy and has played a leading role on the global level by hosting the second phase of the world summit on the information system. To introduce and sustain the integration of ICT in education, Tunisia has implemented a multi-dimensional strategy based on modernizing its infrastructure. Training and professional development of teachers and administrators were also considered as keys to successfully implementing ICT at all stages of the teaching-learning process. Distance education opens new horizons and constitutes a rich field of research, innovation, and creation that still needs to be reinforced and further developed (Hamdy, 2007). Tunisia has taken a decision to develop the education system by developed ICT system in all

Universities, especially for teachers and administrators, in order to achieve development in all sectors, especially education one. Hence, Given the importance of individuals in predicting and improving the use of e-learning technologies, information technology has become an urgent necessity in Tunisia Universities and colleges. Thus, the goals of this study from the giver's side, i.e. the instructors, are to determine the willingness of instructor to adopt e-learning tools, analyze the impact of instructor's cognitive factors, affective factors and the perceived quality of e-learning systems on their willingness to use such systems, determine the relationship between the instructor's willingness to use e-learning systems and their perception of the quality of such systems. Whereas that from the receiver's side, i.e., the students are to measure student's perception of the quality of e-learning tools, define the student's preferences for assisted instructor tools in e-learning systems and define the student preferences for multimedia tools in e-learning systems.

Literature Review

People learn in different ways. Some people they tend to remember 10 percent of what they read, 20 percent of what they hear, 30 percent of what they see, 50 percent of what they hear and see, 70 percent of what they discuss with others, 80 percent of what they try to do, and 95 percent of what they teach to others (Bush, 1997). Thus, we distinguish between learning and education, since learning is a process that brings together cognitive, emotional, and environmental influences and experiences for acquiring, enhancing, or making changes in one's knowledge, skills, values, and world views (Nichols, 2008). People learn from their experience, while the formal education is given and govern by specialized institutions like colleges, universities, and schools or by the state. The nonformal education refers to education which takes place outside of the formally organized school. E-learning is a term that most frequently is used for web-based distance education, with no face-to-face interaction. Electronic learning is a planned teaching/learning experience that uses a wide spectrum of technologies—mainly Internet or computer-based—to reach learners. In this paper, we concentrate on e-learning in terms of formal education content and initiatives, sometimes classified as the fifth generation of learning. In 1981, the Japanese announced a program of research on the fifth generation of computing systems (FGCS) that would integrate advances in the integration of database systems, artificial intelligence, and humans in a new range of computers that are closer to people in their communication and knowledge-processing capabilities (Gaines, 1984). E-learning has been introduced at many universities and colleges as one strategy with which to transform teaching and learning. The appropriate use of information and communication technologies at many universities and colleges reflects a blended approach (technology-enabled approach) to teaching and learning, with asynchronous online communication tools, such as email or online discussion forums forming an essential part.

Table 1, summarizes the comparison between e-learning and traditional learning.

	e-Learning	**Traditional Learning**

Classroom Discussions	The teacher usually talks More than the student.	The student talks at least as much as or more than the Teacher.
Learning Process	The learning is conducted with the whole class participating; there is almost No group or individual study.	Most of the learning process takes place in groups or by Individual student.
Subject Matter	The teacher conducts the lesson according to the study program and the existing Curriculum.	The student participates in determining the subject matter; study is based on various sources of information, including web databanks and net experts Located by the student.
Emphases in the Learning Process	The student learns "what," not "how"; the student and the teachers are busy completing the required subject matter quota; the student is not involved in inquiry-based education and in solving problems, but in tasks set by the Teacher.	The student learns "how," and less "what"; the learning includes research study, which combines searching for and collecting information from web data-banks and authorities on the communications network; the learning is better connected to the real world, the subject matter is richer and includes

		Material in different formats.
Motivation	The student's motivation is low, and the subject matter is "Distant" from them.	The student's motivation is high due to their involvement in matters that are closer to them and to the use of Technology.
Teacher's Role	The teacher is the authority.	The teacher directs the Student to the information.
Location of Learning	The learning takes place within the classroom and the School.	The learning takes place at No fixed location.
Lesson Structure	The teacher dictates the structure of the lesson and The division of time.	The structure of the lesson is affected by the group Dynamics.

Source: Hamdan Bin Mohammed e-University (2009): e-Learning vs. Traditional Learning

Requirements for effective e-learning initiatives**.**

It has been widely accepted that e-learning requires interactivity to improve learners' skills and deliver results. Creating effective e-learning also requires some creativity and knowledge of basic design principles, but that is what makes it interesting, as the e-learning process helps student to understand, rather than to memorize, as in the traditional learning process. Research in cognitive science (Bransford, Brown, & Cocking, 2000) has shown that people remember better, longer, and in more detail if they understand, actively organize what they are learning, connect new knowledge to prior knowledge, and elaborate. The best way to remember is to understand, elaborate, and organize what one already knows (Bransford, Brown, & Cocking). O'Reilly (2005) considers that Web 2.0 offers the platform for creating collaborative learning environments that foster meaningful learning. Research about the potential of using Web 2.0 tools, like blogs, wikis, podcasts, and RSS, in teaching and learning will be explored.

Table 2 summarizes the criteria that can serve as the basis for evaluating an online course.

√ Prerequisites, if any, is clearly stated.
√ Current knowledge level of student is assessed as appropriate for course.
√ Course goals are clear and appropriate.
√ Objectives are clear, behavioral and measurable and are appropriate to course goals.
√ Learning activities are linked to course objectives.
√ Content is organized by modules, units, lessons, or other meaningful architecture.
√ Formative evaluation is provided to student through ongoing feedback (emails, and
Discussion board postings).
√ Evaluations are linked to objectives.
√ Instructor assumes a facilitative role.
√ Syllabus is online and complete, including course expectations, goals and objectives,
√ Grading criteria and course policies.
√ Support for student questions is provided (e.g., instructor contact information,
FAQs, discussion board for questions).
√ Discussion boards and/or is chat available; group activities, email, and orientation to technology are provided.
√ Instructor communicates how he or she will give feedback, including frequency of feedback on
discussion forums, assignments, etc.
√ Feedback is evident through announcements, emails, discussion postings, or other means.
√ Student receive orientation to posting in discussion forums, submitting to drop boxes,
Taking online exams, and using any other type of technology that will be utilized during the course.
√ Student is provided the opportunity to collaborate with other students through group work or other means.
√ Progress through the course is documented.

√ If online testing is used, it includes detailed instructions as to how it will be administered and
Permitted settings. If possible, a practice test with the same settings should be given first.
√ If online testing is used, it should not comprise the greater portion of the final grade (best practice: "open book" testing).
√ Student is provided information as to where to get technical help.

Effective e-learning environment (Liaw, Huang & Chen, 2007).

In designing effective e-learning environments, Liaw (2004), suggested three factors are considered: learner characteristics, instructional structure, and interaction. When developing e-learning, it is necessary to understand the targeted population. First, learner characteristics, such as attitudes, motivation, belief, and confidence need to be identified (Passerini & Granger, 2000). But this is not an easy thing to do in the best el-learning environment. Essentially, e-learning signifies self-directed learning environments where users have more opportunities for self-directed learning. As for instructional structure, multimedia instruction enables learners to develop complex cognitive skills, such as understanding important elements of conceptual complexity, the ability to use acquired concepts for reasoning and inference, and the competence and flexibility to apply conceptual knowledge to novel situations (Spiro, Feltovich, Jacobson & Coulson, 1995). Finally, e-learning environments offer group interaction, such as learner-to-learner, or learner-to-instructor. Group interaction is a kind of cooperative learning that helps learners to make progress through their zone of proximal development by the activities in which they engage (Vygotsky, 1978). When learners increase their interaction with instructor and other learners, they increase their ability to build knowledge because so much learning takes place within a social context, and the process includes the mutual construction of understanding (Bruner, 1971). Thus, based on fundamental e-learning criteria, the three kinds of e-learning environments, a combination of which are needed to create an effective overall e-learning environment, are autonomous learning,

multimedia environments, and teacher-assisted learning (Fig. 1).

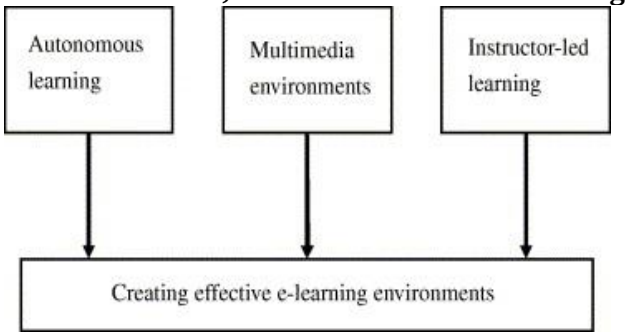

Fig. 1. The Parts of Effective e-learning.

Source:*(Liaw, 2007)*

Online learning programs are showing a sign of substantial growth as more resident student has begun to enroll in them (Carr, 2000). (Roach, 2002) estimated that "As many as half the students in online courses are from the traditional 18-to-25-year-old student cohort who normally takes campus-based courses". Based on this research, there are nine primary requirements for effective e-learning implementation in the Tunisia:

1. **Learning culture:** Before any campaign can be implemented, the audiences need to be informed of the opportunities and challenges of e-learning. Educators and administrators need to be aware of the benefits of e-learning in the classroom, as well as the specific technologies involved.
2. **Change leadership:** E-learning's association with change is an interesting one, and change management itself is one of the key drivers for e-learning adoption. Most educational organizations are very conservative, so an educational technologist not only has to worry about pedagogy and technology, but also about organizational issues.
3. **Organizational infrastructure:** The organization's infrastructure is the permanent foundation on which e-learning is built. Infrastructure must address an organization's existing culture, governing principles, processes, and structures that will contribute to the success or failure of an e-learning effort.
4. **Learning strategy:** Organizations need a comprehensive learning strategy that moves beyond basic delivery of learning opportunities. Successful organizations build infrastructure systems that support performance, content, and resource management. Therefore, an e-learning strategy should motivate people, improve productivity, enable skill development, and aid retention across the enterprise.
5. **Learning resources and networked learning:** Facilitated e-learning makes use of the capabilities of learner-led e-learning and adds the benefit of having an instructor guiding the learners. This approach requires the use of e-mail, discussion forums, and chat capabilities, depending on whether communication will be synchronous or entirely asynchronous.
6. **Pedagogy, curriculum design, content and development:** Institutions must ensure that pedagogy and curriculum are flexible, adaptable and relevant to students from a diverse range of cultural and language backgrounds.
7. **Quality:** The two most important criteria for evaluating quality in e-learning are that it should function technically without problems across all users and have clearly explicit pedagogical design principles appropriate to learner type, needs and context.
8. **Cost reduction:** A successful e-learning initiative should reduce costs over the long term, improve individual and business unit performance, help maintain core competencies, and enable the organization to react quickly to competitive pressures and market needs.
9. **Research and evaluation:** Includes both assessment of learners and evaluation of the instruction and learning environment Attitudes toward e-learning (Liaw, Huang & Chen, 2007).***Many institutions of higher education have turned to e-learning for authentic learning and to enhance learning performance, while other schools are jumping on the bandwagon simply because they do not want to be left behind***

(Govindasamy, 2002). When instructor exhibit more positive attitudes toward e-learning, then they have more behavioral intentions to use it. Indeed, no matter how advanced or capable a technology, its effective implementation depends on users' having a positive attitude toward it. Although the concept of attitude toward computers has gained recognition as a critical determinant in the use and acceptance of computer technology, there is no single, universally accepted definition of the computer attitude construct (Liaw, 2002; Smith et al., 2000). Previous research (Triandis, 1971) has suggested that attitude consists of affective, cognitive, and behavioral components: the affective component is the emotion or feeling, which includes statements of like or dislike toward certain objects; the cognitive component refers to statements of beliefs; and the behavioral component is what an individual actually does or intends to do (Liaw, 2002). The three-tier technology use model (3TUM) is a conceptual approach for investigating user perceptions toward information and Internet technologies. The original concept of 3-TUM was derived from TAM (the Technology Acceptance Model), a popular approach for surveying user attitudes of information technologies (Davis, Bagozzi & Warsaw, 1989). TAM suggests that two specific behavioral beliefs, perceived ease of use (EOU) and perceived usefulness (U), determine an individual's behavioral intention to use technologies. Based on the 3-TUM (Fig. 2), individual attitudes toward information technology form three different tiers: the tier of individual experience and system quality, the affective and cognitive tier, and the behavioral intention tier. The tier of individual experience and system quality evaluates how individual experience and system quality influence individual affective and cognitive components. The affective and cognitive tier investigates how affective and cognitive components change individual behavioral intentions. In the behavioral intention tier, the 3-TUM predicts individual behavioral intentions to use technology for a particular purpose (e.g., search engines as learning-assistance tools or computers).

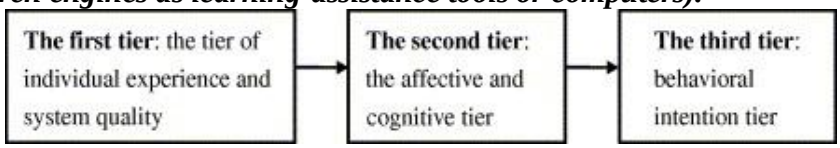

Fig. 2. ***The three-tier use model (3-TUM).***

Source: ***(Liaw, Huang & Chen, 2007)***

Research Methodology

Hypotheses

H1: Faculty members' willingness to use e-learning systems does not depend on their perception of the quality of such systems, supported by cognitive and affective aspects of using such systems.

H2:Faculty members' willingness to use e-learning systems does not differ with their perception of the quality of such systems.

H3: Student's perception of the quality of e-learning systems does not differ with their liking for the instructor assisting the learning in such systems.

Research Methodology and Sampling Details: The blueprint for executing this research was prepared in keeping with the nature of the problem identified and the objectives for the work. Hence, a descriptive research design with two separate questionnaires for the primary data collection was employed. The survey for this study was conducted in two major institutions of higher education in Tunisia. The valid sample size of survey respondents was 162, comprised of 96 students and 66 faculty members. The sample size of the faculty member represents more than 80 percent of the total population of the instructor employed in the educational institutions considered in the present study, while the sample size of the students represents 50 percent of the senior-batch students, who are on the verge of graduation in both the institutions. Further, due care was taken regarding the majors of the students who took part in the survey; the responses from the students who opted for an IT major were not considered in the final analysis in order to eliminate undue bias that may have arisen in the responses to the system considered. Thus, the sampling procedure adopted for this survey can be categorized under the judgment sampling method. The primary data pertaining to the present study was collected in March 2009.

Questionnaire Development: The questionnaire for this study was developed based on a survey of the literature and was adapted from previous research. Respondents expressed their feedback regarding the effectiveness of e-learning courses or programs through a series of quantitative survey questions. Perceptions were gathered in the following areas: quality of e-learning, e-learning efficiency and collaboration**,** e-learning flexibility, communication support and e-learning pedagogic

Training evaluation scale: In order to reduce measurement error, the scale that accompanies each question on the attitudes and perception was designed and constructed appropriately, using the Likert scale. The issues to be addressed when constructing a Likert scale are the number of response options and the placement of response options. The Likert scale generally uses an odd-numbered, five-point scale with the following response alternatives: Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree, weighted 1, 2, 3, 4, and 5, respectively. The odd-numbered Likert scale allows for the adoption of a neutral point (3), which represents no expression of agreement/disagreement. The advantages of using a five-point Likert scale with the neutral point include:

- The neutral point allows for expression of uncertainty.
- The neutral point doesn't force the participant to answer.
- When the neutral point is omitted, there is a greater tendency to give no response.
- The Likert scale has greater reliability than a scale with fewer points.
- Likert scales are empirically more valid than forced-choice scales.
- The scale reduces acquiescent response bias (the tendency to respond "yes" indiscriminately to a forced-choice scale).
- A five-point Likert scale is more cost-and time-effective than a seven-point scale

- Measurement uses an interval scale, placing equal distance between the response options when determining placement. Equal spacing allows people to assign "equal psychological distance" between each of the options and to regard those options as convenient references or stopping points along the continuum of the concept being measured.

Table 3

Results of Cross-tabulation for Student's Perceived Quality of e-learning Systems and Their Preference for Instructor-assisted Learning

Perceived quality of learning with e-learning systems		**Preference for instructor-assisted learning**			Total
		Low	High	Very High	
	Low	7	5	7	19
	High	5	10	26	41
	Very High	5	5	26	36
Total		17	20	59	
Pearson Chi-Square Value =34.867*			Degree of freedom = 4		N=96

*Significant at 5 percent level

Student's preference for multimedia assisted learning systems.

Table 4

Distribution of Instructor's Willingness to Use e-learning Systems

	Frequency	Percent	Valid Percent	Cumulative Percent
Low	4	4.2	4.2	4.2
High	54	56.3	56.3	60.4
Very High	38	39.6	39.6	100.0
Total	96	100.0	100.0	

Table 3 shows that the chi-square value of 34.87 with 4 degree of freedom is significant at 5 percent level and that 70 percent of the students have high or very high perceptions of the quality of e-learning systems, along with high and very high liking for instructor-

assisted learning. Based on these results, hypothesis 3 is rejected and there is a strong likelihood that there is an association between students' perception of the quality of e-learning systems and their preference for instructor-assisted learning. More than 95 percent of the students indicated high or very high preferences for multimedia-assisted learning. Table 4 shows the willingness of the faculty members to use the E-learning platform to the educate the students. The results show a bit of reluctance from the instructor's side as the percentage of "High" stands substantial at 56.3 and 60.4 cumulatively. Thus, based on the above results it can be considered that the Hypothesis 1 and 2 can be rejected as well, since more than half of the pool of instructors showed that willingness to use the e-learning systems has a positive correlation with their perception of the quality of these systems.

Results

1. The instructor who participated in the present study showed high levels of willingness to adopt e-learning systems in their pedagogy. In this context, their willingness to adopt e-learning systems is strongly affected by three major factors: cognitive factors, affective factors and perceived quality. A significant level of dependency was also noted between the instructor's willingness to adopt e-learning systems and their cognitive measurements and perception of the quality of such systems.
2. A significant level of association could be found between the Instructor's willingness to use e-learning systems and their perception of the quality of such systems. More specifically, this kind of association exists among those who have higher levels of perceived quality of e-learning systems. Thus, it's also found that the instructor with low levels of perceived quality of e-learning systems have low levels of willingness to use them.
3. A significant level of association was found between the students' preference for instructor-assisted learning and their perception of the quality of e-learning systems. More specifically, this kind of association exists among those students who have higher levels of preference for instructor-assisted learning, so e-learning systems can be an excellent supplementary tool for conventional teaching pedagogy, although they may not totally replace more conventional methods of teaching and learning.
4. Both the instructor and the student showed high levels of perceived quality of e-learning systems and willingness to use e-learning systems. In fact, e-learning systems have higher levels of operational acceptance with the student and instructor who have higher levels of perceived quality on such systems.
5. Less than 5 percent of students expressed a dislike of e-learning tools, while 95 percent accepted them.

Conclusion

Thus, to conclude, we can say that all the three hypotheses stand false. The instructor's willingness to adopt the new e-learning systems, with or without supported by cognitive and affective aspects of using such systems, are positively correlated with their perception of the quality of these systems. On the other hand, the results of the students also showed a noteworthy connection between the perception of the quality of e-learning systems and their preference for instructor-assisted learning. Based on our findings, we see several implications of the study and can make several suggestions related to its findings. Educational institutions may adopt e-learning systems along with their conventional teaching learning systems to a greater degree than is currently the case. Since such systems have wide acceptance both from instructor and student, expanding e-learning opportunities may be a way to maintain higher levels of quality in the teaching-learning exercise. However, cost is an important factor to consider when implementing a new set of ideas or technologies. Although many institutions are moving towards more e-learning, it should be given more emphasis. In particular, educational institutions should recruit instructors with high levels of ICT (Information and Communication Technology) ability in order to encourage an environment more conducive to the migration of the teaching-learning system in the direction of e-learning systems. The high level of student acceptance of instructor-assisted learning confirms the importance of instructor in the teaching-learning environment as a whole. However, educational institutions should work toward finding the optimal mix of instructor-assisted and e-learning-based teaching-learning environments. Such an optimal mix will contribute significantly to maintaining quality in the institutes of higher education. The instructor in various educational institutions should incorporate a greater mix of multimedia instruction in their pedagogy. Since there is resounding acceptance of the use of multimedia systems, from the student's perspective, institutions should take steps to develop multimedia presentations that can enhance the quality of the teaching-learning environment as a whole. Such a mix also presents good business opportunities for software multimedia. Educational institutions whose instructors have lower levels of ICT expertise should implement training on ICT for such instructors in order to enable them to face the challenges of the future, particularly as they related to increased use of e-learning-based systems.

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Appendix

Demographic Information

The people participating in this survey belonged to two major institutions of higher education in Tunisia. The total survey sample size was 162 people, comprising of 96 students and 66 faculty members. The sample size of the students consists 50% of the senior-batch students, who are on the verge of graduation in both the institutions, and that of the faculty member consists of more than 80 percent of the total population of the instructor employed in the educational institutions considered in the present study. Also, in order to avoid biased results, the students, who opted for an IT major were not considered in the final analysis.