

Information and communications technology use as a catalyst for the professional development: Perceptions of tertiary level faculty

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ABSTRACT

This study highlights the impact technology can have on the teaching-learning environment to the point of influencing and altering the educational ecosystem. A 5-point Likert scale was designed to elicit tertiary level instructors' attitudes regarding the use of ICT in their professional lives at an institution of higher education in North Lebanon. The survey also elicited responses concerning the use of the LMS, Moodle. The findings reveal some ambiguity in this population regarding the benefit of ICT in their professional lives and at this institution specifically. The findings support the design of a new innovative technology acceptance model which would link innovative teaching practices through the use of technology to perceptions of professional development. The research also resulted in recommendations for further research that could inform the development of a tertiary level educational ecosystem.

Keywords: *educational technology; professional development; institutional change*

INTRODUCTION

Information and communications technology (ICT) has encroached on educational processes to such a degree that it has become an integral and vital part of the educational ecosystem – part of the interconnectedness of the active and collaborative learning environment with all stakeholders. ICT is now so fundamental to the way knowledge is gathered and disseminated that the educational ecosystem may be compromised if it is absent or even if it is not utilized to advance and enhance learning or the teaching - learning environment. The symbiotic relationship between ICT, educational processes, and teaching and learning has become a major area of study in the scholarship of teaching and learning in higher education. There are many ways that ICT can and does function within this educational ecosystem. Building on the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh, Morris, Davis, and Davis (2003), this research intends to investigate how university professors and instructors make use of and interact with ICT, specifically learning management systems (LMS), for the enhancement of and innovation of their teaching practices and improvement of their professional activities.

Institutions of higher education are becoming more aware of the need to offer e-learning courses in addition to the ones disseminated in a traditional manner (Raman, Don, Khalid, & Rizuan, 2014) in order to compete in a globalized educational landscape. E-learning and the use of LMS, which support instructors in creating and managing their courses, constitute a new paradigm for higher education with the rapid development of information and communication technologies (ICTs). Such realization has made many universities revamp their existing strategies and consider the adoption of technologies which aid them in accomplishing new educational objectives (Alhabri & Drew 2014). Realizing the foreseen need to update their instructional facilities – computer and communications labs and instructional technology units – and envisioning distance learning programs and the role technology plays in the promotion of active learning, many universities have begun to adopt LMS as an ICT tool through open-source software such as Moodle.

Learning management systems are believed to promote a constructive approach to building knowledge and supporting active learning (Emelyanova & Voronina 2014). Yet, such belief remains questionable among some instructors who show resistance towards fully embracing LMS use. Investigating faculty acceptance and resistance to the adoption of learning management systems and understanding their behavioral intentions to use software applications to deliver online material to students while tracking their progress have gained the interest of scholars in the Arab world and the Middle East North Africa (MENA) region in recent years (Bousbahi & Alrazgan 2015; Al-Busaidi & Al-Shihi 2010; Alharbi & Drew, 2014). To examine the faculty's level of acceptance of LMS and their LMS usage patterns, technology acceptance models such as the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) have been used to assess the stakeholders' perceptions of the usefulness and ease of use of such software as instructional aides. These perceptions are guided by factors that comprise the UTAUT model namely, performance expectancy (PE), social influence (SI), and facilitating conditions (FC), which may all have positive or negative influences on the faculty's behavioral intentions (BI) to use the system. Our study further connects behavioral intention to innovative teaching practices and recognizes these as synonymous to professional development. In that sense, this study explores the link between innovative teaching practices through the use of ICT/LMS and self awareness of professional growth.

ACCEPTANCE AND USE OF TECHNOLOGY

It is often claimed that technology has become “the heart of economic growth” (Rondan-Cataluna, Arenas-Gaitan, & Ramirez-Correa 2015, p.788), a “key ingredient” to the economic success of a nation and “an element of its vitality” and status as a global power (Lawrence & Miller 2014, p.6), which probably explains the continuing quest to ensure user acceptance of technology and the way researchers are becoming overly concerned about technology adoption and diffusion (Williams, Rana, & Dwivedi 2015). Research into the adoption and diffusion of technology into institutions of higher education, especially in countries not typically associated with technological advancement, is beginning to inform a situation whereby technology is impacting institutions of higher education globally, according to a report prepared by UNESCO (Altbach, Reisberg, & Rumbley, 2009). How the impact is manifesting and whether or not the impact is grounded in theoretical assumptions needs to be explored in this context.

Comparisons of the different versions of popular technology acceptance models and investigations into the factors that promote or hinder such acceptance, adoption, and usage at the individual and organizational levels are now said to be “ripe topics in information systems (IS) literature” (Rondan-Cataluna, Arenas-Gaitan, & Ramirez-Correa 2015, p.788) and one of its “most mature streams” (Venkatesh, Thong, & Xu 2012, p.157). In fact, ensuring user acceptance of and willingness to adopt technology remains one of the most extensively researched aspects in information management literature (Benbasat & Barki 2007; Venkatesh et al. 2003).

Popular Acceptance Models

Users' willingness and/or reluctance to accept technology and integrate it in work-related tasks has been explained in many ways (Venkatesh et al 2003). In order to predict technology usage and adoption in various organizational settings, theoretical models have been devised since the 1980s when the first technology acceptance model (TAM) by Davis (1989) appeared. For close to three decades, models and theories of technology use have been developed and built on to depict factors which influence intention and usage of information technology. Starting from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen 1975) to the Technology Acceptance Model (TAM) of Davis (1989), and then to the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003), many constructs have been added and several

previously established factors revisited to explain the nuances pertaining to the users' perceptions of technology usefulness, which naturally inform their behavioral intentions to make good use of it.

UTAUT and the Personalization of the Teaching and Learning Process

According to Venkatesh et al. (2003), four main factors have a direct influence on the user's intention and actual use of technology. Three of the factors that are relevant to this study include: *performance expectancy* (PE), or the "degree to which using a technology will provide benefits to consumers in performing certain activities" and *effort expectancy* (EE) or the "degree of ease associated with consumers' use of technology" (Venkatesh, Thong, & Xu 2012, p.157). These two factors are combined with *social influence* (SI), which is shaped by perceptions of others' opinions and feelings toward such use. The latter can explain the fourth factor, *facilitating conditions* (FC), which affect the users' perceptions of the resources and support which are made readily available for them to perform a particular technology-related behavior. Other individual factors such as gender, age, socio-economic background, and experience can also moderate the various intertwined relationships that exist among the different UTAUT factors.

Building on the relevant three constructs of their first theory, Venkatesh, Thong and Xu (2012) thought of three additional factors which form new relationships with the previous ones and thus shape the behavioral intention and the use behavior of technology, moderated by age, gender, and experience. These include *hedonic motivation*, *price value* and *habit*, all three believed to be key predictors in much broader behavioral research. Looking at it from a motivation theory perspective, Venkatesh et al. (2012) believed hedonic motivation, or the pleasure the consumer and/or user derives from making use of technology, had an influential role in determining technology acceptance. The cost and pricing structure were also seen as having a significant impact on the perceived value of a particular technology, especially when considered from the perspective of benefits relative to monetary cost. Finally, experience and habit or the extent to which the user's behavior becomes automatic with the passage of time, have been identified by the researchers as important determinants of technology adoption and diffusion.

Technology acceptance models have been traditionally used in corporate contexts primarily but we are employing this model in an academic setting. The context of this study, which is an academic environment, has a more ambiguous policy toward IT use than corporate contexts typically do. Specifically, this context has employed the use of the open source LMS, Moodle, without initiating an accompanying policy regarding expectations for its use. Therefore, it is important to note what the relationship between technology's perceived usefulness - in the form of ICT and LMS - is and its relationship to tertiary level faculty's professional development.

Technology as an innovative tool within tertiary teaching practice

Learning Management Systems have been cited as a vehicle for the development of a more personalized learning approach for students and by extrapolation the teachers as well (Moyle 2010). Personalization of the teaching learning process requires innovative thinking and creative planning. Innovation can be defined as the introduction of something new or even altering, and renewing (Moyle 2010). It is also seen in both product, as well as the process. The terms *innovation* and *creativity* are often used interchangeably and vary in meaning among educational theories (Sawyer 2004; Runco 2008; Shaheen 2010) and policy documents (Loveless 2002; Ferrari, Cachia, & Punie 2009; Moyle 2010). There are at least five characteristics of creativity: using imagination; a fashioning process; pursuing purpose; being original and judging value (Loveless, 2002) which alters, changes, transforms, creates something new, all of which are attributes associated with innovation and all of which are attributes associated with teaching.

It is indisputable that the ubiquity of technology has influenced and altered the management of everyday tasks including all processes associated with education. More and more professional educators are relying on digital tools to perform professional tasks such as lesson plan creation, creation of lecture presentations, communication with colleagues and students via email and more recently via Google Hangout and Skype. Many professionals are even becoming comfortable with using various software programs for creating course materials. Gone are the days of using messy mimeograph machines and overhead projectors have long been replaced by LCD projectors. The list is long and the ramifications are plentiful. Professional educators can, through modern digital tools, create high quality materials that correspond well to the learning objectives of their lessons; they can create dynamic learning environments that engage students in immediate, real world type activities. These changes seem to be happening on their own; the proliferation of these tools and their ease of use have irrevocably altered the way professional educators work.

Purpose of the study

The momentum of this digital shift has resulted in a situation where educators, particularly in the MENA region, may not realize how or why they are using the technology; their use of it is often not grounded in any theoretical understanding of its impact. For example, technology and content or technology and practice and pedagogy should be reciprocally related if the technology being used is innovative by the definition offered above. To gain the theoretical understanding requires that educators be knowledgeable of both the how and what of technology use. However, Mishra and Koehler (2006) argue that teacher training workshops that focus on an accumulation of inert facts and are commonly thought of as professional development will not result in teachers growing professionally. Such an approach will not develop knowledge of application or integration. This traditional strategy to teachers' professional development has commonly, and for a long time, been criticized for its reductionist approach (Blase & Blase 1994; Loucks-Horsley & Matsumoto 1999). In addition, tertiary level instructors may be devoid of pre-service teacher training and may begin their teaching careers by virtue of holding a doctoral degree in their discipline of speciality. While tertiary instructors may be given ample opportunities for professional development training, both in instruction and instructional technology, there is often resistance to alter their practices (Deaker, Stein & Spiller, 2016; Marzilli, Delello, Marmion, McWhorter, Roberts & Marzilli, 2014; Keengwe, Kidd, & Kyei-Blankson, 2009). This study aimed to discover whether or not technology has the power to alter practice, with or without theoretical grounding, as evident in the practice of some tertiary level instructors at this institution, particularly in their use of LMS. This study also investigated whether instructors were aware of any such impact on their practice and their professional status, namely whether those could be enhanced or altered as a result of the platform.

SIGNIFICANCE OF THE STUDY

In the literature reviewed, there was no mention of a direct link connecting the use of ICT or LMS, specifically, to innovative teaching methodologies and teaching styles. In particular the UTAUT and UTAUT2 models have not been used to measure perceptions of LMS or ICT use as a vehicle for professional growth of tertiary level faculty. This study utilized the constructs the models are built on to gain insight into the usefulness of technology as a strategy for professional development. This study looks at innovation as an indicator of faculty keeping current in their teaching practices through their "implementation of new methods, tools and content which could benefit learners" (Ferrari et al. 2009, p.5). Using technologies in teaching practices allows educators to re-conceptualize their own practices by looking at the new links between teaching, learning and technology. Digital information and communication technologies are the tools, which when properly chosen and applied, can aid in enhancing innovative teaching processes.

This article is part of an ongoing research (Melki, Nicolas, Khairallah, & Adra 2015) which aims to explore the connections between UTAUT, innovative teaching practices and professional growth. The research being reported here intends to answer the following questions.

1. How do faculty at this institution accept and use ICT, including LMS, in their professional lives?
2. Do faculty at this institution perceive their use of ICT and LMS as catalysts for their professional status and growth?
3. Do faculty members at this institution perceive ICT and LMS as a means to innovate their teaching practices to further their professional growth?

The above questions are being investigated in a context where the infrastructure is ranked 116 out of 140 in the latest report generated by the World Economic Forum (2015). The same report ranks Lebanon 66 in terms of technological readiness. In addition, this particular institution does not have a published policy on the use of technology for instructors. This tertiary institution's infrastructure would suggest that technology does not seem to be a top priority although an IT Unit to support instructional technology and disseminate knowledge on the use of LMS and related advances has only lately been formed.

RESEARCH METHODOLOGY

A survey design was decided on in order to canvas a large number and diverse sample of professors. In addition, the quantifiable data the survey instrument would generate would reveal the prevailing perceptions of these faculty concerning the role technology and LMS, specifically, affect their teaching practices and possible professional growth. After reading a copious amount of literature (Privateer 1999; Mumtaz 2000; Glass 2001; Oliver 2002; Savery 2002; Bates 2003; Ertmer 2005; Lieberman 2005; Jimoyiannis & Komis 2007; Wang 2008; Garrison & Akyol 2009; Sarkar 2012; Ertmer, et al. 2012; Beetham & Sharpe 2013; Rienties, Brouwer & Lygo-Baker 2013; Lowenthal et al. 2013; Dahlstrom, Brooks & Bichsel 2014; Venkatesh, Croteau, & Rabah 2014; Deaker, Stein & Spiller 2016; Ng'ambi et al. 2016) on the role of technology in an academic setting, the researchers identified important areas for IT in a professional academic's work life were identified. Subsequently, the researchers designed a survey, based on the constructs of the UTAUT model, to investigate the interrelatedness of ICT use and acceptance, including LMS with innovation in the teaching-learning process and an academic's professional growth.

An online survey was distributed to all professors in the university, except for the School of Medicine, constituting a total population of 540 people. The survey was distributed 3 times in an effort to garner more responses since online surveys typically achieve a much lower response rate than paper-based surveys (Nulty, 2008). The researchers decided to move to data analysis after 6 weeks of trying to secure more responses from the population. The final research population resulted in 57 participants, or 10.55% of the total population. Although there does not seem to be a universal minimum acceptable response rate (Johnson & Owen, 2003), the researchers acknowledge that 10.55% of the population is a small sample size but also consider it adequate for the intention of this research.

Survey instrument preparation

The online survey was selected because this strategy was compatible with the nature of the study, whose thematic concern is technology acceptance particularly in online environments. In addition, an online survey is the fastest and easiest way of collecting data from a large population of respondents with minimal cost in terms of resources and time (Covili 2015). The data responses were automatically stored in the survey database providing easy handling of data and

resulting in fewer errors. A template was selected from those provided by Google Docs. The questionnaire was split into two parts. The first part was expected to be filled by all the respondents and the second part was requested only from those who have used an LMS.

The survey instrument in the form of a Likert scale was designed by the researchers based on the constructs of the UTAUT model to investigate the elements pertaining to technology acceptance and use at this institution. We also included constructs to gauge teachers' perceptions of how IT influences their perceptions of their own professional development and if technology impacts innovative teaching practices. A 5-point scale which included the choices of strongly agree, agree, not sure, disagree, strongly disagree was decided on, thereby respecting proliferation issues (Clark & Watson 1995). Additionally, the researchers decided that a wider granularity on the scale would eliminate intensity of choice. Finally, the research team agreed that an 'undecided' or 'not sure' option was important for this research context since we had some concern that respondents would not feel that it was 'right' to answer on the negative side of the scale as in a forced choice design. Also, the 'not sure' option can yield important data in terms of perceptions of and attitudes towards something new or different from the status quo. Several versions were constructed and revisions were made to make sure none of the statements was poorly worded and that no inconsistent responses could come from any pair or sequence of statements. Eventually, once the researchers determined that the survey would yield the type of data needed to address the research questions, face validity was established by having an expert in survey construction and design read and evaluate the survey (Best & Kahn 1998) to make sure all statements were applicable, comprehensive and not redundant.

FINDINGS

This section will first present the data in tables that divulge the constructs that comprised the Likert survey and a brief interpretation of each table is offered.

Data presentation

The construct displayed in Table 1 reveals participants' perceptions of their abilities concerning the use of ICT systems. General data concerning 'the ease of use' and 'abilities' as initial indicators of general acceptance toward the use of technology were collected. The construct was designed to gauge the general impact that technology has on professors' professional practice.

The table clearly shows that a large majority of respondents find it easy to use a variety of digital tools and claim to know how to use them. All the statements address using technology for professional, autonomous practice. The majority of respondents answered on the agree side of the scale to these statements, which corroborates Knowles' (1980) assertion that moving from dependency towards self-directed learning is a normal part of maturation. The data also elucidate a situation that is relatively homogeneous in perception. The faculty at this institution seem to be of like mind regarding the place of technology in their careers with just a small number of outliers. However, the Table also reveals that about a third of the respondents register either a 'not sure' response or a response in disagreement. Either response highlights the need for intervention and training on the digital tools that could aid professors and help them to adjust their thinking on practice.

Table 1: Participants' perceptions of their abilities

Statements related to abilities	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
I find it easy to use the following kinds of ICT systems: SIS	36.84%	36.84%	10.53%	12.28%	3.51%
I find it easy to use the following kinds of ICT systems: Social Networks	33.33%	36.84%	19.30%	3.51%	7.02%
I find it easy to use the following kinds of ICT systems: Webmail	49.12%	38.60%	7.02%	3.51%	1.75%
I know how to convert material to digital format	45.61%	36.84%	12.28%	1.75%	3.51%
I can find time to convert my course materials to digital format	14.04%	40.35%	28.07%	12.285	5.26%

The construct revealed in Table 2 deals with social influences on a teacher's use of ICT in their working life.

Table 2: Teacher's use of ICT in their working life

Statements related to influences	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
My peers think I should use technology for teaching	7.69%	42.31%	38.46%	3.85%	7.69%
My students think I should use technology for teaching	21.05%	33.33%	38.60%	0.00%	7.02%
The administration thinks I should use technology to be promoted	3.51%	10.53%	42.11%	28.07%	15.79%
The administration thinks I should use technology to be innovative	22.81%	33.33%	29.82%	14.04%	0.00%
The administration thinks I should use technology to prepare for distance learning	12.28%	29.82%	38.60%	12.28%	7.02%
The administration thinks I should use technology to be competitive with other universities	15.79%	35.09%	35.09%	10.53%	3.51%
It is important for my professional development to use LMS	31.82%	31.82%	31.82%	2.27%	2.27%

The table shows that a large number of respondents answered 'not sure' or on the disagree side of the scale, suggesting a lack of an explicit policy regarding IT integration being communicated through the line management at this university. The fact that so many respondents are 'not sure' if their peers or the students or the administration think that technology is an important or even necessary addition to the tertiary educational context may suggest that the institutional culture does not promote aspects of a 21st century pedagogical landscape. Interestingly, most respondents give first the students and then their peers the most credit for expecting innovation at the teaching level. Given that the majority of students at this point in time are so called 'digital natives' (Prensky, 2008, 2010, 2012; Tapscott, 2009; Oblinger & Oblinger 2005), this is a logical way of thinking. The administration's role in influencing teachers' use of technology is less strong

according to these respondents. This data provides a correlation with the data in Table 1. Finally, the percentages for the final statement in this construct confirm the opinion that LMS can be an important strategy for the professional development of these teachers.

The construct displayed in Table 3 was designed to capture individual work traits, specifically efficiency and productivity. It was also designed to look at how the use of ICT and LMS could help to enhance the quality of course management both on and off campus. The participants overwhelmingly responded on the positive side of the scale, stipulating that using both the internet and ICT increases their productivity. While they weighed in positively to the uses of the internet in general, the respondents became less assured when they were questioned on the reliability of the internet at home and on campus. In general, the respondents were confident in their own organizational skills when using LMS but more varied responses for statements 3, 4, and 7 indicate that using LMS to manage their course resources, their course activities and their overall workload varied from strongly agree to a more neutral 'not sure'. In the 3 statements (#5, 6 and 7) in Table 3 on the impact of the LMS on course organization, a high percentage of instructors consider LMS as a supportive tool in their teaching. In the same 3 statements, it can also be noted that almost one-third of those who agree are not sure whether the LMS helps them or not. This result is possibly a sign of a lack of understanding of what LMS is and what it can do. In the 3 statements (#5,6,7) dealing with the positive impact LMS has on course management, approximately twice as many respondents agreed with the positive contributions of LMS as those who strongly agreed. The final statement in Table 3 reveals that 15.38% registered a disagree position concerning the contribution of the LMS to workload organization.

Table 3: Individual work traits

General perceptions of the impact of ICT and LMS	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
The internet increases my productivity	68.42%	29.82%	1.75%	0%	0%
The computer increases my productivity	84.21%	15.79%	0.00%	0%	0%
I can rely on the internet at home to work efficiently	40.35%	28.07%	21.05%	8.77%	1.75%
I can rely on the internet on campus to work efficiently	35.09%	29.82%	17.54%	14.04%	3.51%
Using LMS makes it easy to manage my course resources	27.50%	50.00%	22.50%	0.00%	0%
Using LMS makes it easy to manage my course activities	25.64%	46.15%	25.64%	2.56%	0%
Using LMS makes it easy to organize my course load	17.95%	46.15%	20.51%	15.38%	0%

The construct displayed in Table 4 was designed to capture the respondents' perceptions of their innovative uses of LMS on both their teaching and student learning. Respondents were asked whether LMS allowed them to develop new ways of assessing their students or whether it has helped enhance the teaching-learning environment. They were also asked whether LMS allowed them to incorporate creative tasks and methodologies in their teaching. The responses to the statements in Table 4 suggest that the respondents are not totally convinced of the role LMS can play in developing innovative practices. The majority of respondents answered either 'not sure' or on the negative side of the scale. These professionals need to be convinced of the utility of LMS in their professional lives (Macharia & Theunis 2014). The positive responses, however, do suggest that teachers might be aware of the potential of LMS in this area. The final statement on Table 4 asking whether using LMS is engaging to the user was also placed within the innovative construct because engagement is a foundation for innovation in any field (Davis & Lass 2014). The response of 82.92% of the population answered on the positive side of the scale for this

statement, which suggests a willingness on the part of a large percentage of respondents to engage with LMS for their professional growth.

Table 4: Perceptions of their innovative uses of LMS

Innovative Uses of LMS	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
LMS has helped me develop new ways to assess students' skill level	9.76%	21.95%	46.34%	21.95%	0%
Using LMS allows me to incorporate creative tasks to give to students.	12.20%	43.90%	21.95%	21.95%	0%
Using LMS allows me to incorporate creative methodology in my classes	12.20%	48.78%	19.51%	19.51%	0%
LMS has enhanced the learning experiences by making students more engaged	7.32%	48.78%	31.71%	12.20%	0%
Using LMS is engaging to me	19.51%	63.41%	14.63%	2.44%	0%

The construct for Table 5 reveals general perceptions of the use of LMS. The construct was designed to gauge the perceptions of the survey respondents regarding the perceived usefulness as well as ease of use of LMS in class and outside of class.

Table 5: General perceptions of the use of LMS

General perceptions of LMS Use	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
I find it easy to use Moodle as an LMS	28.07%	36.84%	22.81%	7.02%	5.26%
LMS has made the lines of communication more open with students	19.51%	53.66%	19.51%	4.88%	2.44%
LMS has made the lines of communication more open with colleagues	4.88%	26.83%	39.02%	21.95%	7.32%
LMS helps me model the skills and knowledge students need for the 21 st century	19.51%	41.46%	34.15%	4.88%	0%
Using LMS is a good idea for my classes	29.27%	58.54%	9.76%	2.44%	0%
I use LMS to demonstrate my professionalism	21.95%	48.78%	21.95%	4.88%	2.44%
LMS is well-suited to my teaching and learning context	19.51%	56.10%	21.95%	2.44%	0%
LMS is adaptable to my teaching and learning context	21.95%	56.10%	21.95%	0%	0%

Two-thirds, or 64.91%, of the participants say they find the use of Moodle as an LMS easy. The data regarding the impact the use of LMS has on the respondents' professional practice reveal that their perceptions of LMS as a facilitative, engaging tool that is well-suited and adaptable to their teaching and learning contexts are to a large extent similar. This result corroborates findings of a study conducted in Kenya that discloses that perceived usefulness has a direct effect on the intention to use ICT to the point of adjusting behavior (Macharia & Theunis 2014).

Table 5 makes known the respondents' perceptions of the impact the use of LMS has on their academic work. 87.81% of the respondents answered on the positive side of the scale when affirming that using LMS is a good idea for their classes. In addition, Table 5 also reveals that a considerable number of the participants in the survey, 70.73%, think favorably that the use of LMS has a beneficial effect on their professionalism. In fact, almost three-quarters of them see LMS as an indicator of their professional behavior and standard. 75.61% of them also believe such use is well-suited to their teaching and learning context, with 78.05% believing LMS is adaptable to this context.

Importantly, 60.97% of the survey respondents think LMS can help them model the skills and knowledge students need to possess in the 21st century educational landscape. Finally, although close to three-quarters of the population sampled think utilizing LMS has made the lines of communication more open with their students, less than a third (31.71%) believe the same about LMS use making communication lines more open with their colleagues. The respondents in this study were very restrained regarding their perception of administrative support for their use of LMS and technology in general.

The construct displayed in Table 6 is concerned with the general perceptions of the adequacy of ICT support provided by the administration at this university, including the opportunities for training. The data displayed in Table 6 suggest that many respondents do not view LMS as connected to the ICT support offered by the university. This revelation suggests that users of LMS are not aware that this system is a technological tool that they can use to enhance their teaching. 15.79% claim not to get enough ICT support; yet only 6.98% say there is not enough support for LMS suggesting that these respondents do not view LMS as part of ICT. Also, 43.86% are not sure if enough training is provided on ICT and 36.36% are not sure if there is support for them to convert materials to digital format.

The inferred ambiguity about what ICT is at this university and the kind of support and training available to the teaching ranks may speak to the lack of IT policy at the institutional level. In fact, an explicit technology policy stating that the senior management supports the use of digital devices for the academic work of the faculty or even wants faculty to use and integrate devices into their academic work does not exist. The small percentage in Table 6 (3.57%) strongly agreeing that senior management supports the use of digital devices may be interpreted as an indicator of the respondents' awareness of the absence of a well-defined IT policy.

Table 6: Perceptions of the adequacy of ICT support

General perceptions of the support provided by UOB	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
Adequate ICT support is provided for me	12.28%	42.11%	29.82%	10.53%	5.26%
I am provided with enough opportunities for training on how to use IT effectively	12.28%	33.33%	43.86%	5.26%	5.26%
I have enough technical support to convert my course materials to digital	16.36%	21.82%	36.36%	14.55%	10.91%
The senior management of UOB supports the use of digital devices	3.57%	26.79%	48.21%	17.86%	3.57%
Adequate LMS support is provided for me	6.98%	62.79%	23.26%	2.33%	4.65%

EMERGENT THEMES

Despite the small number of respondents to the survey, the researchers were able to extract some themes that could elucidate the perceptions and attitudes of faculty members at this institution regarding the use of technology in their professional lives and for their professional growth. Through the analysis of the data 3 themes emerged that serve to explicate the situation at this institution. Further, the themes reveal understanding that could possibly inform other investigations using technology acceptance models to investigate technology use. This section will supply a discussion of the 3 themes and answer the research questions that guided this study.

Theme 1: Innovative teaching tied to perceptions of professional development

As has been reported above, one of the focuses of this research has been to discern the perceptions that faculty at this institution has regarding the innovative ways ICT, and specifically LMS, improve their teaching and professional activities. The data can be interpreted as suggesting that the expression of innovative teaching practices is tied to the faculty's perceptions of their own professional development. In other words, the percentage of professors who thought that using technology and LMS in innovative ways is a similar percentage of professors who thought they would enhance their practices in ways that could be recognized as progressing professionally. The extent, depth and detail of those innovative practices at this institution require more extensive research.

According to Table 4 above, instructors use ICT and LMS to enhance their teaching practice and keep it current. While a large percentage of respondents are 'not sure' if these tools enhance their practice in any way, more than half recognize that LMS and ICT nurture creativity and enhanced pedagogical practice. The ability of ICT to stimulate reflection on practice (Fairchild, Meiners & Violette 2016) could be a contributing factor to the perception of these respondents' view. Renewing practice is the catalyst for professional growth and professional growth implies status. Consequently, an inference can be drawn that these respondents do perceive the use of ICT and LMS as a means of embedded professional development even if they are not consciously aware of that function of the technology tools. The 'not sure' contingent may require additional training in the ways technology can be used in the teaching/learning environment. This group may be using the tools out of some sense of obligation or for other reasons. The data from this study does not elucidate other reasons for choosing to use technology tools. Importantly, as other studies have pointed out, beliefs in the efficacy of ICT or e-learning do not always precede changes in practice (Scott 2016). Consequently, investigation into these teachers' practices to see if their pedagogical practice is, in fact, altered without them realizing it, needs to be considered.

The data does, however, allow for an inference that at least these respondents are willing to explore new ways of working, and ways to enhance their practice. The general perceptions of the respondents regarding the use of technology in their daily work are overall positive (Table 3) which suggests that these instructors are ready to utilize these tools to cultivate professional growth. The positive responses suggest that innovation as an aspect of technology use in an academic context is the motivating factor for instructors to experiment with it (Marzilli et al. 2014). Yet, the data suggests that the dialectical tension of change versus stability reported by Fairchild, Meiners and Violette (2016) is one that is evident at this research site. Further exploration of this tension is necessary.

Theme 2: The need for institutional guidance for the realization of full LMS potential

Regarding the attitudes about the LMS particularly (Table 5), while respondents report on the positive side of the scale for each statement in this construct, a much larger percentage chose

'agree' rather than 'strongly agree' and a large percentage chose 'not sure' to most statements. An inference can be drawn from this result that while these instructors are aware of the value of this learning management platform in their academic life, they require some kind of additional support and/or training to fully realize the tool's potential. There seems to be a lack of comprehension concerning the ability of an LMS to promote and support active learning (Emelyanova & Voronina 2014). Switching to a model of course management and delivery based on the use of LMS would require changing, or at least modifying, course learning outcomes and overall educational objectives (Alhabri & Drew 2014) an initiative that perhaps this group of academics is not ready to do or not prepared to do based on this data.

Respondents answered in an ambiguous way concerning their attitudes and perceptions of administrative support in both Table 6 and Table 2. The ambiguity lies in the large percentage of 'not sure' responses to statement 3 in Table 2 and statement 4 in Table 6 that both ask about administrative support, making it difficult to draw a conclusion about these respondents' attitudes concerning the administration's view of technology in the professors' work lives. This data suggests that senior administration need to find a mechanism to promote and value tertiary level instructors' pedagogical growth and therefore, continual professional development in order for it to become an integral part of their work life, and hence become a much more embedded part of the educational ecosystem (Ferrari, Cachia, & Punie 2009).

Theme 3: The use of Technology in teaching and its link to innovative practices

In broad terms, this research strongly points out the need to consider innovation in the use of technology in teaching practices, especially in a tertiary context. The respondents in this study are not totally convinced of the role LMS can play in developing innovative practices (Table 4). The majority of respondents answered either 'not sure' or on the negative side of the scale. This finding highlights the idea that users' perceptions of technology usefulness and ease of use cannot be considered in isolation from the factors of innovation and creativity. The adoption of innovative teaching practices promotes professional growth and therefore provides an incentive for continual professional development. Emelyanova and Voronina (2014) assert that learning management systems are a catalyst for a constructivist approach to active learning and teaching activities based on a constructivist learning theory would likely be innovative. Such an attribute can be instrumental to promoting innovative practices in a tertiary level course.

CONCLUSION

The three research questions are convincingly answered through the emergent themes. Faculty members appear to accept the use of ICT and LMS in their professional lives but are not fully aware of its potential in altering and/or renewing their personal practice. This perception leads to the answer of the second question. These faculty members do not seem to realize that ICT and LMS may be catalysts for professional growth, much less status. The administration at this institution seems to be somewhat culpable in fostering that perception since the institution is without a clear vision of the role technology plays in a tertiary learning environment. Finally, these faculty members, as a cohort, are not unanimously aware of ICT and LMS as being a means to innovate their teaching practices. Many are, however, which means that through a grassroots approach, awareness of this synergy may spread throughout the ecosystem in the absence of a clear institutional policy.

This study highlights the impact technology can have on the teaching learning environment to the point of influencing and altering the educational ecosystem even without conscious direction or vision. Each context of ICT use provides a specific complexity in the context of use (Loveless, 2002); the educational ecosystem needs to accommodate the level of complexity at this

institution. There needs to be a realistic recognition of the vital part technology plays in the educational process at the top levels of administration at this institution in order for fundamental change to happen at all levels of the ecosystem. Online education at the tertiary level is quickly becoming recognized as an effective educational model internationally, and also in Lebanon; therefore, the university at the center of this inquiry is encouraged to promote this model and provide clear guidelines for the running of these courses based on this model.

Recommendations for further study

The way technology can be used as an integral component of the teaching-learning process requires further study in this research context particularly. In addition, further research should be considered to explore the connections between ICT use and acceptance, innovative educational practices, and professional development. The findings from this study can support a work plan for an IT unit at any educational institution to further the institution's professional development initiatives.

In addition, in order for any educational ecosystem to evolve and adapt to the advent of technology additional recommendations for further research are offered. The findings from the study suggest that further investigation into the connection between teacher motivation and technology use is necessary as well as investigation into dialectical tension of change versus stability. Furthermore, a more in-depth study needs to be undertaken to link perceptions of innovative teaching practices to an enhancement of personal professional development.

Importantly, the findings support the design of a new innovative technology acceptance model (ITAM) which would include the innovation construct. The goal would be to provide a valid model useful not only to assess but to plan innovative processes for educational improvement taking into consideration faculty professional development as a fundamental factor rather than only placing emphasis on students' learning.

Innovation often starts with people's enthusiasm, their desire to be creative and innovative. From this attitude and commitment to practice, policy can be generated. The ecosystem adjusts and adapts to the change that is happening. Without a vision to guide the change, the ecosystem may not develop in a logical, sustainable way. The results of this study can begin to inform the vision and serve to assist the interconnected elements, both internal and external, to function for the greater good and stability of the educational ecosystem.

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