Exploring Micro and Macro Level Appropriation of an E-learning Platform: A Study in a Middle Eastern and a Western Educational Contexts

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Abstract

E-learning platforms such as Learning Management Systems (LMS) are tools that are designed to enhance teaching and learning experiences and overcome a range of educational problems. Despite its availability to academics and students in most universities around the world, evidence show that these systems have not been effectively adopted to realise their full potential, especially in the Middle Eastern educational context. To this effect, in this study a conceptual model is designed that captures micro and macro level views of e-learning platforms appropriation encompassing: individual, technological, organisational educational policies and cultural aspects within the Middle Eastern context (Saudi Arabia) in comparison with that of a Western context (Australia). The model provides a framework that allows: (1) academics and educational institutions to assess the value realisation of such platforms for positive learning experiences; and (2) obtain deeper knowledge about key components of user behaviour in different cultural settings.

Keywords E-learning, Learning Management Systems, Appropriation, Multilevel.

1 Introduction

With the rapid advancement in Information and Communication Technology (ICT), the adoption of e-learning platforms is increasing among universities around the world despite their complexity, high risks and heavy costs (Coates et al. 2005). They provide enhanced teaching and students' learning experiences and quality management facilities (Coates et al. 2005). However, previous studies on e-learning platforms such as the Learning Management System (LMS) suggest it is underutilised in a higher education context (e.g., Alshammari 2015; Zanjani et al. 2013).

In the IS literature, many studies have focused on assessing the effectiveness of technology use by exploring the post-adoption behaviour (also called actual use or appropriation) and its determinants (Jasperson et al. 2005; Saeed and Abdinnour 2013). However, multilevel research in exploring user behaviour towards IT in the post-adoption phase is still evolving (Bélanger et al. 2014; Jasperson et al. 2005; Nan 2011).

Most prior studies that address e-learning adoption from a micro level view focus either on students or academics perspective and they rarely consider both collectively (Islam et al. 2013). Moreover, prior research has mostly looked at the e-learning platforms at an abstract level regardless of the diversity of e-learning features that provide different possibilities of use to achieve different pedagogical goals (Islam et al. 2014). To understand the full potential of e-learning features and its appropriation by academics and students, technical factors should be addressed. However, little is known about how the emergent technologies such as web and mobile-based LMS influence users' behaviour toward LMS appropriation of features (Mtebe and Kondoro 2016). Furthermore, there is little evidence in how the advancement and the constant increase in the use of the social networking services (SNS) in the education field influences the use of LMS (Arhinful 2016).

From a macro level perspective, researchers suggest that work environment structures that include organisational support, policies, rules, business processes have a major influence on post-adoption behaviour (Jasperson et al. 2005; Nan 2011). However, education institutes are culturally correlated with a social context (Välimaa 1998). Therefore, it is important to consider different dimensions of culture in examining user behaviour in education contexts. Culture is broadly described as the values, assumptions and potential acting that have been absorbed during the lifetime and reflected in individual behaviours (Hofstede 2011).

Cultural differences among countries, specially between western and eastern countries, exhibit diverse differences in people's attitude towards technology and their behaviour in general (Leidner and Kayworth 2006). Particularly, in the educational context, culture leverages different teaching and learning styles grounded in belief between western and eastern countries (Pinpathomrat et al. 2013). Many studies argue that in non-western countries, there is a lack of "cultural fit" which is when the values embedded in a given technology match the community values in which this technology is introduced, thus adopted and used (Leidner and Kayworth 2006). The absence of this kind of fit may lead to contradictions and thus, if unresolved, there is an increase chance of users rejecting the technology (Aldraehim et al. 2013). Further, Middle Eastern countries are considered as late adopters of e-learning platforms compared to the western world (Mirza and Al-Abdulkareem 2011). Due to diverse cultural values, theories that consider the cultural aspects of technology appropriation are constructed in the western world contexts. Consequently, there is a space in the IS literature for a multilevel and collective view on cultural influence on e-learning appropriation in non-western contexts, where theories from the west may not directly apply. Furthermore, the majority of studies conducted in Middle Eastern countries address acceptance and early adoption (Alshammari 2015). Little is known about how people use these technologies effectively once initially adopted. Thus, exploring e-learning platforms at a post adoption stage in a comprehensive manner is necessary.

This research in progress aims to provide a comprehensive and multilevel analysis on "how" and "why" academics and students appropriate the e-learning platforms. The study takes place in two diverse cultural contexts for a comprehensive comparison of the influences of cultural, organisational, educational, technological and individual factors in different contexts, Saudi Arabia represents Middle Eastern countries and Australia represents western countries.

This study aims to answer the following research question: *How and why are e-learning platforms such as LMS appropriated by academics and students in higher education within different cultural contexts?*

To answer this question, the following sub-questions are proposed that include both the micro and the macro level perspectives: (1) To what extent do the work environment influence the appropriation of e-

learning platforms by academics and students? (2) To what extent does the culture –national, organisational, educational and IT use- influence the appropriation of e-learning platforms by academics and students? (3) To what extent do the individual characteristics influence the collective appropriation of e-learning platforms? (4) To what extent does the interaction between academics and students influence the collective appropriation of e-learning platforms? And (5) To what extent do the technical factors influence the appropriation of e-learning platforms by academics and students?

The next section provides a review of the existing literature in the IS context (section 2). A conceptual framework is then designed and described in line with the theoretical background in which the model is derived (section 3). The research design is explained in section 4. Finally, we conclude with potential contributions to theory and practice.

2   Adoption and Appropriation of E-learning Platforms

There has been extensive IS studies that provide rich background on technology adoption behaviour (e.g., Venkatesh and Bala 2008) with considerable focus on post-adoption both at individual and organisational levels (e.g., Burton-Jones and Straub 2006; Mendoza 2011). The adoption behaviour is a decision made by an individual or/and organisation to use a specific technology, and the post-adoption behaviour is the behaviour that should include the use of the technology to some extent (Kishore and McLean 1998). The Post- adoption phase is the longest in the IS lifecycle and thus many variations of users' behaviour toward the adopted technology are developed. According to Carroll et al. (2002) through this phase i.e. appropriation, users may explore, evaluate and adopt or reject the technology. Thus, There is potential to use the technology capabilities to some extent and/or reject others after adopting it (Carroll et al. 2002; Mendoza 2011). Aligned with that, but in more details, Jasperson et al. (2005) looked at technology as a collection of features used to describe the post-adoption behaviour. They describe the post-adoption behaviour as the stage when an individual can explore, adopt and use one or more of the application features in a mandatory or voluntary basis as well as the possibility to extend one or more of these features. The extended use requires applying the features in usage behaviour that are beyond what it is designed for. Related concepts include "exploratory use" (Saeed and Abdinnour 2013) and "trying to innovate with IT" (Ahuja and Thatcher 2005). While some studies looked at the appropriation at an individual level (e.g., Carroll et al. 2002; Mendoza 2011), others suggest to consider a multilevel research to capture the whole view of technology appropriation (e.g., Bélanger et al. 2014; Jasperson et al. 2005; Nan 2011).

To provide a deep and comprehensive understanding of the post adoption behaviour of academics and students toward the e-learning platforms such as LMS, this study will consider a multilevel view. As such e-learning appropriation and its determinants on micro and macro perspectives are explored as explained further in the following sub-sections.

2.1   Micro- and Macro- Level Perspective

The learning management system is described as an e-learning platform that provides a wide range of pedagogical and course administration features that assist academics and students in the learning process (Coates et al. 2005; Boateng et al. 2016). The LMS has become the most adopted e-learning system in the higher education field around the world (Alshammari 2015; Coates et al. 2005). Two types of LMS dominate usage within the university setting: (1) using LMS for delivering fully online courses and (2) using LMS as a supportive tool to the traditional face-to-face courses, also called blended learning (Coates et al. 2005; Sharpe et al. 2006).

LMS draws its effectiveness from the interaction of use between academics and students (Islam et al. 2013). Thus, both individuals' behaviour and their interaction is worth considering in order to understand the collective appropriation process (Nan 2011). The micro-level view in technology appropriation indicates the important role of users demographic and individual differences (Jasperson et al. 2005) as well as individual cognition and emotions (Nan 2011). However, most prior studies focus on one type of user: either academics (e.g., Alshammari 2015; Padayachee 2013) or students (e.g., Arhinful 2016; Boateng et al. 2016).

Furthermore, reviewing the IS literature shows that the majority of e-learning adoption studies examine the system use on an abstract level without considering the details of the system's features (e.g., Alshammari 2015; Boateng et al. 2016). Nevertheless, e-learning platforms such as LMS integrate many features that provide possibilities of use and encompass different values and these features, therefore, need to be addressed individually.

Additionally, the role of organisational factors is vital in the post-adoption phase (Ahuja and Thatcher 2005; Jasperson et al. 2005). This includes the continuous support provided by the organisation to foster a creative work environment (Ahuja and Thatcher 2005; Nichols 2008). The work environment is characterised by organisational policies, rules, work requirements and support. However, the work environment characteristics that promote and prevent the diffusion of e-learning are shaped by the culture – both nationally and organisationally (Bergquist and Pawlak 2008). Thus, it is important to consider the organisational factors by capturing the big picture and taking into account the influence of the surrounding contextual culture within an educational environment.

2.2 Technology and Feature Centric View on LMS Appropriation

In the IS literature, many studies predict users' adoption and appropriation of technology thorough their intention to use it. For example, the Theory of Reasoned Action (TRA) and its derivative models such as Technology Acceptance Model (TAM) (Venkatesh and Bala 2008; Venkatesh and Davis 2000). However, these measurements lack accurate identification of the actual usage behaviour (Burton-Jones and Straub 2006; Islam et al. 2014). Furthermore, measuring the system's actual usage can vary from minimal measurement such as use/non-use and duration of use to more encompassing measurements such as features used to perform specific tasks (Burton-Jones and Straub 2006). Burton-Jones and Straub (2006) identify that measuring the actual system use requires linking system features to relevant content.

In the e-learning context, there is no fixed number of LMS features, yet these systems have been expanding and increasing in complexity (Morgan, 2003). Moreover, each feature may encompass different pedagogical values and serve different goals. However, the pedagogies perspective and learning objectives behind these features relatively remain constant (Bower et al. 2010). Sharpe et al. (2006) define a pedagogy-objective framework that identifies the modes of engagement in using the e-leaning platform. They specify four pedagogies goals related to the use of LMS that lead to significant enhancements to learning and teaching process. These are: communication, assessment, collaboration and access to learning content. These modes aligned with the attributes of a successful classroom: expectations, support, assessment, feedback and involvement (Tinto 2012). Therefore, LMS features can be mapped with certain pedagogies goals in order to measure the system use. Thus, the pedagogical goals represent the tasks that the user want to obtain when using the system (Burton-Jones and Straub 2006).

In regard to the technological dimensions, some prior research in technology appropriation have examined the role of system characteristics such as ease of use, ease of learning to use (Mendoza 2011), flexibility, reliability and information accessibility (Nan 2011). However, little is known about how the emergent technologies such as mobile-based LMS influence users' appropriation of LMS. In this regard, researchers suggest examining the role of the individuals interacting across different platforms of the same system, i.e. web-based and mobile-based LMS when measuring the usage behaviour of the corresponding system (Burton-Jones and Straub 2006; Nan 2011). Furthermore, there is little evidence on how the advancement and the constant increase in the use of the Social Networking Services (SNS) in the education field influences the appropriation of LMS features (Arhinful 2016). These complementary technologies have been examined by some studies in other contexts (e.g., Shih and Venkatesh 2004). Shih and Venkatesh (2004) found that the presence of other complementary technologies impact positively on the intense of using the computer at home at post-adoption phase.

2.3 Cultural Impact

Culture at various levels – national, organisational and group – plays an important role in prompting an effective use of technology (Leidner and Kayworth 2006; Straub et al. 2001). Moreover, it shapes the teaching and learning practices (Teräs et al. 2014). Researchers suggest that the culture levels should be addressed collectively to understand complex individual and organisational behaviour and use (Straub et al. 2001; Välimaa 1998).

National culture is defined as the "collective programming of the mind which distinguishes the members of one human group from another" (Hofstede 2011). Hofstede's culture dimensions are widely used to understand similarities and differences among countries. Despite the criticism over Hofstede's dimensions such as its western focused and over generalisability, it is suggested that these dimensions are the most predominate and robust tool to measure the national culture (Alkhaldi and Al-Sa'di 2016). Consequently, these dimensions will be used in this study as a start point to discover the difference among context under examination. Australia and Saudi Arabia showing a significant contrary result in two of Hofstede's cultural dimensions which are power distance and individualism (Hofstede 2011). For example, Australia is a highly individualist culture which means that people are

expected to be self-reliant and take care about themselves and their immediate families. In contrast, Saudi Arabia is a highly collectivistic culture that is most Saudi people value the group which could be family, extended family or other relationships.

Organisational culture is defined as a set of implicit beliefs that members hold about how they behave and respond to the environment (Schein, 1995). Bergquist and Pawalak (2008) categorise the modern universities culture into six dynamic types which are collegial, managerial, developmental, advocacy, virtual and tangible. The last two types are added in response to the advancement in e-learning. For example, one attribute of members in a virtual culture is their interest in keeping pace with the latest technological innovations to make resources available inside and outside the university (Bergquist and Pawlak 2008). This attitude toward the technology will indeed shape the support that provided and the technical resources to promote the use of e-learning. In contrast, one of the members attributes in tangible culture is that they value face-to-face education in their university (Bergquist and Pawlak 2008) which may in turn constrain the use of e-learning.

On a group level, academics and student culture includes the assumptions that relate to teaching and learning motivations and beliefs on the one hand and technology use on the other hand. Vatrapu (2011) provides the differences in learning styles in traditional classroom settings according to Hofstede's dimensions. Such differences are reflected in academic and student practices. For example, in individualist society (e.g., Australia), students are expected to speak up upon a general invitation from the teacher, while in collectivistic culture (e.g., Saudi Arabia) students only speak-up in respond to a direct invitation (Vatrapu 2011). In a comparison between western and eastern culture, Pinpathomrat et al. (2013) propose a National Culture-Influenced Learning Motivation (NCILM). They suggest that this model is useful to increase the adoption rate of e-learning by understanding different learners' values and styles according to the national culture. They argue that students in eastern culture are more focused on the exam and grades while western students are more directed by their personal interest in the subject and the meaning (Pinpathomrat et al. 2013). However, this model focuses on student's motivations and styles more than the academic view and teaching styles. It is argued that it is important to understand the implicit beliefs that shapes both the academics and students styles to promote effective learning and teaching process (Fry et al. 2003).

Finally, IT culture is claimed to be an important determinant that enriches IT usage exploration (Walsh et al. 2010). Technology use culture adopted from the Walsh et al. (2010) framework identifies nine types of IT use cultures. These archetypes are grouped into three categories: pro-active users involved in technology in voluntary settings and have a high intention to innovate with IT, passive users who use IT to meet their minimum needs and mostly in mandatory settings, and refusal users whose neither have interest nor motivation in using technology. However, these types of IT usage culture have not been explored in learning settings where users' motivations and needs are linked with the pedagogical perspectives and cultural perspectives.

In summary, mapping various levels of culture with the use of e-learning on a micro and macro level is crucial to gain a deeper insight on the appropriation process of e-learning platforms such as the LMS. In the next section, we design and propose a new conceptual model that encompasses culture on multilevel, individual factors, technological factors and organisational factors.

3 A Conceptual Model for Appropriation of E-learning Platforms

In order to answer the research question, multiple theoretical concepts have been adopted: (1) The definition of actual system usage (Burton-Jones and Straub 2006), (2) The framework of Complex Adaptive System (CAS) in IT use (Nan 2011) and (3) The Activity Theory (AT) (Nardi 1998). These concepts are explained in line with the proposed framework below.

The proposed conceptual model in Figure 1 demonstrates the micro and macro level of e-learning appropriation. On a macro level, the model focuses on measuring the actual usage behaviour rather than the intention to use e-learning platforms. The actual systems usage is defined as "when an individual user utilises of one or more features of a system to perform a task" (Burton-Jones and Straub 2006 p. 231). Thus, by adopting this definition, the actual usage of e-learning platforms such as LMS must involve: (1) *users* - students and academics, (2) the e-learning *platforms* and their specific features and (3) the pedagogical *objects* and their attributes.

To address the relationships between these elements, the interaction concepts are adopted from the (CAS) in IT use (Nan 2011). Nan's model is based on the theory of Complex Adaptive System (CAS) to define how a collective-level IT use patterns emerges from the individual-level IT use constructs. It helps in understanding the use process framed by users, IT and contextual structures. A significant

concept in CAS is the interaction. Nan (2011) defines two types of interaction which may leverage a variation in IT use of the system. These are the system-user interaction and the interpersonal interaction. In this model, these interactions are illustrated as the interaction between students and academics with web or/and mobile e-learning platforms and also the interaction between students and academics and their attributes (illustrated in a thick arrow between academic and student entities in Figure 1). According to Nan (2011), CAS in IT use doesn't explain how the interaction between different IT platforms can affect the individual user behaviour (Nan 2011). Therefore, an extended type of interaction between the two e-learning platforms is included in our model to enrich the interaction concept especially between multiple platforms from the same system (illustrated as a thick arrow between web based e-learning platform and mobile based e-learning platform entities in Figure 1). Moreover, as stated the model suggests that the process of e-learning appropriation is influenced further by e-learning functionalities, characteristics and the complementary technologies.

On the macro level, the work environment is defined as a structure of the university policies, rules, regulations and support that is provided to academics and students. Furthermore, the education system characteristics in which the appropriation process takes place are anticipated to shape and direct the appropriation of e-learning. This top-down view is essential to complete the full picture of individuals' appropriation of e-learning platforms.

Although the CAS for IT use provides an exploration on the constructs that influence the use of IT, the CAS theory lacks a detailed explanation regarding "how" and "why" e-learning is appropriated within the cultural context. Therefore, the Activity Theory (AT) is adopted to complement the conceptual model. AT is a powerful framework for analysing human practices that are mediated by tools in interlinked individual and social levels (Nardi 1998). The contradiction is a key principle in AT and are described as the tensions that open the chances of innovation through understanding the conflicts and working through it (Nardi 1998). AT is beneficial as an analysis lens of the appropriation concept in this study. For example, AT will help in guiding the data analysis in identifying the contradictions, if any, between academics and students' when they interconnect their behaviours, attitudes, beliefs, perceptions and emotions toward e-learning platforms. Moreover, it is anticipated that contradictions may occur between the culture and the appropriation process of e-learning platforms. Thus, the proposed model suggests the influence of culture on different levels: national, organisational, teaching and learning and IT culture. We believe that such extension of the CAS for IT use and the use of AT concepts will bring both exploratory and explanatory statements to the study context.
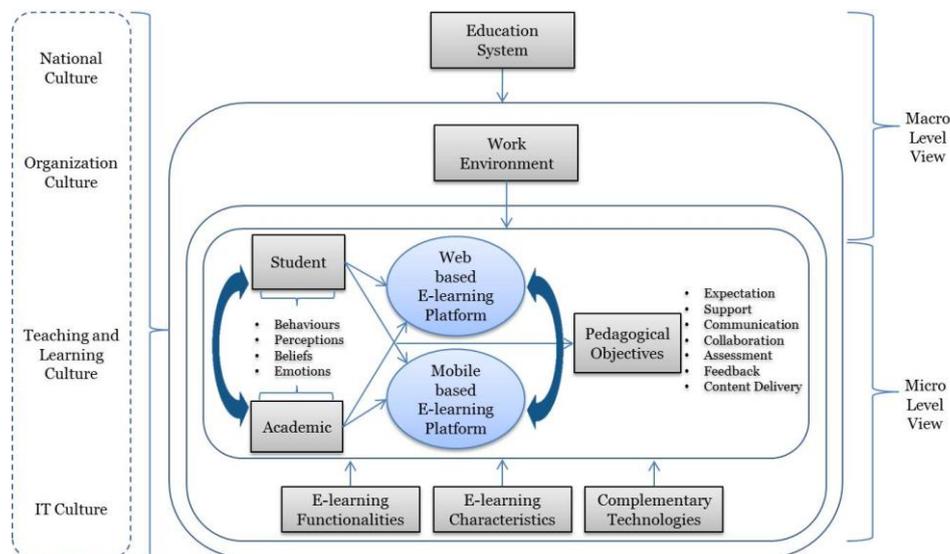

Figure 1: A proposed model for appropriation of e-learning platforms

4 Research Design

This study contains exploratory and explanatory elements (Yin 2014). It is a study that explores not only the appropriation of an e-learning platform at three levels namely the organisational, individual and technological level, but also the cultural aspects at various levels that influence the technology appropriation. These factors collectively have not been fully explored in the appropriation literature in an educational context. A key aim is to investigate how and why academics, students and universities as a whole appropriate an e-learning platform in a Middle Eastern context compared to appropriation

in a western context. To tackle this, a multi-case design will be used to gain in-depth understanding of the phenomena of e-learning appropriation and the given context (Yin 2014).

The multiple cases will take place in two different countries: Saudi Arabia and Australia. Each context varies in the culture, language, education policies and the use of e-learning platforms such as the LMS. In Saudi Arabia, the study will take place in two universities. The two institutions differ in (1) date of establishment (one is the first and oldest university in Saudi Arabia, while the other is a relatively recently established university) and (2) the gender of the academics, students, and staff (i.e., one of them is for females only). These differences will provide a more comprehensive view and comparable analysis of the study of the differences between organisational cultures and their effect on LMS use by academics and students. Since the culture is highly related to the discipline (Välimaa 1998), the focus will be in the engineering and computing departments to make a valid comparison among the cases.

On the other hand, in Australia, two of the largest and oldest universities are chosen due to the large number of Saudi students enrolled in the engineering and computing departments in different levels. This case aims to analyse: (1) How students from a Saudi Arabian culture that are presently studying in these Australian universities appropriate the LMS including their attitudes, perceptions and usage behaviour of the LMS and (2) How students and academics from western cultural backgrounds appropriate the LMS.

Data will be gathered from multiple sources to seek triangulation (Yin 2014). These methods include:
   a) Semi-structured interviews to obtain in-depth understanding of how and why academics and students appropriate e-learning platforms to achieve particular pedagogical objectives. The interviews target academics and students in Saudi Arabian universities, Saudi students in Australian universities and Australian academics and students in Australian universities. Further, to obtain a top down view on the appropriation of LMS from the organisational perspective, the interviews also target the head of departments, e-learning managers and LMS administrators in Saudi Arabian and Australian universities.
   b) Questionnaires will be sent prior to conducting the interview to the participants named above. The objectives of these questionnaires are to gather the basic demographic data and measure the frequency and depth of using LMS features by academics and students.
   c) The LMS tracking system in Saudi Arabian universities and Australian universities will be used to obtain objective data on usage behaviour to evaluate the self-reported usage.
   d) Documents provided by the universities in Saudi Arabia and Australia will be analysed such as manuals, learning policies, and other evidences that highlight the organisation culture and education system that influence the appropriation of e-learning platforms.

5 Conclusions

In this paper, we have reviewed the main factors that surround the appropriation of e-learning by both academics and students focusing on a culturally distinct Middle Eastern (Saudi Arabia) and Western (Australia) contexts. The conceptual model has been designed to encompass three key aspects: (1) the micro level perspective presented through an individual and technological view, (2) the macro level perspective presented in the work environment and the larger education system and (3) the cultural aspects integrated across these levels.

The findings from this research are expected to be a significant addition to theory and practice in the broader adoption of LMS. Conducting the study in two different cultural context results in more targeted theory and broadens the range of possible variables in examining how and why users appropriate an e-learning platform. The applicability of the theoretical models will subsequently be examined across culturally distinct nations. Practically, the in-depth analysis of the cultural impact on using the technology will enable managers and decision-makers to resolve conflicts, if any, to gain better value from e-learning platforms and enhance teaching and learning outcomes in a positive manner. Thus, it is expected that this research will contribute to the educational institutes to adequately consider their strengths and weaknesses and provide suitable support to encourage the most effective use of e-learning tools and systems. On the other hand, the results will be beneficial for e-learning providers targeting the Middle Eastern market to consider the cultural differences in developing these systems. We expect the results to be generalised to other countries with similar cultural differences and similarities.

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