Cultural impacts on e-learning systems' success

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ABSTRACT

E-learning systems are enablers in the learning process, strengthening their importance as part of the educational strategy. Understanding the determinants of e-learning success is crucial for defining instructional strategies. Several authors have studied e-learning implementation and adoption, and various studies have addressed e-learning success from different perspectives. However, none of these studies have verified whether students' cultural characteristics, such as individualism versus collectivism (individualism/collectivism), play a determinant role in the perceived e-learning success. This study provides a deeper understanding of the impact of students' cultural characteristics, for individualism/collectivism, on the perceived outcomes of e-learning systems use. This study proposes an e-learning systems success model that includes a cultural construct, individualism/collectivism. This paper reports an empirical study developed through an electronic survey distributed to higher education students belonging to various learning levels and from various universities. The study applies quantitative methods to obtain results. Our findings demonstrate that learners' perceived individual impact is positively influenced by their satisfaction and e-learning systems' use. Results demonstrate the determinant role of individualism/collectivism on individual and organizational impacts. Students influenced by collective culture perceive more individual and organizational impacts than individualistic culture students. Individualism/collectivism also moderates the users' perceived satisfaction on individual impact, and from individual impacts to organizational impacts. The result shows that for the students with a stronger individualistic culture, satisfaction plays a central role in the way they assess the individual impacts, and individual impacts on organizational impacts. This empirical research discusses the theoretical and practical implications.

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1. Introduction

E-learning systems are among the educational enablers of the 21st-century and have a huge impact on the educational ecologies. Technology does not always change education; Dewey said, "*Education is life*" (1897, p. 82). Education is part of a social process in which communication and artifacts play critical roles. Thus, education is part of society and learning is everywhere, and acquiring knowledge is an important asset to any society, organization, or person. E-learning systems are part of a structural infrastructure that leverages knowledge diffusion and acquisition. These systems also allow socialization within a knowledge-sharing context. In sharing contexts, communities of practice may arise, and are the backbone of a social learning system (Wenger, 2000).

Education and e-learning have been the subject of several studies, e.g., modeling e-learning systems' adoption (Abdullah & Ward, 2016; Chen & Liu, 2013; Tarhini, Hone, Liu, & Tarhini, 2016), satisfaction (Aggelidis & Chatzoglou, 2012; Kassim, Jailani, Hairuddin, & Zamzuri, 2012), and success (Wang, Wang, & Shee, 2007a, 2007b). Most studies of e-learning systems stress the adoption of those systems. E-learning success determinants need more in-depth studies, especially in understanding e-learning determinant factors related to cultural characteristics. Cultural characteristics correspond to the individualities that are used to categorize several groups of people (Hofstede, 1980b). Students have their cultural contrasts, for example, in individualism versus collectivism (individualism/collectivism). There are students from individualism cultural backgrounds, who direct their behavior to the attainment of their individual goals. On the other hand, there are students whose social relationships prevail over learning tasks. These students have collectivism cultural characteristics. Individualism/collectivism is a theoretical construct that measures the opposition between individualism and collectivism (low values indicate individualism; high values indicate collectivism).

Actually, e-learning success has been studied from various perspectives (Appendix A). Some success studies focus more on the use of a specific platform or on the attendance of a course (Baker, Boggs, & Arabasz, 2003; Newman, 2003; Wang et al., 2007a, 2007b). Other success studies focus on technological and financial characteristics (McGill, Klobas, &

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Renzi, 2014). Researchers have also studied the impact of students' prior experience on e-learning systems use and success (Gay & Dringus, 2012; Hachey, Wladis, & Conway, 2015; Parkes, Stein, & Reading, 2015). Other studies address the impact of social environment and collaboration in course completion (Artino, 2009; Rosé, Goldman, Sherer, & Resnick, 2015). Some studies have focused on the different types of e-learning strategies and performed meta-studies (Aparicio, Bacao, & Oliveira, 2016; Belcadhi & Ghannouchi, 2015; Means, Toyama, Murphy, Bakia, & Jones, 2009; Means, Toyama, Murphy, & Baki, 2013). However, to the best of our knowledge, none of these earlier e-learning systems' success studies have thought to determine whether individualism/collectivism, which is a cultural dimension according to Hofstede (1984b), and determines or moderates the success in e-learning. This is the motivation for our study. Cultural differences were studied to characterize several countries (Hofstede, 2001; Hofstede, 1984a, 1984b) or to understand cultural attributes that influence new technologies' adoption. To the best of our knowledge, however, none of these empirical studies have examined e-learning systems' success according to individuals' cultural differences. Thus, our research question is: do students' cultural characteristics affect e-learning systems success?

Motivated by the research gap mentioned, and in order to increase the understanding of success factors, Seddon (1997) and Seddon, Staples, Patnayakuni and Bowtell (1999) suggested the inclusion of constructs in the information systems success model (D&M) (DeLone & McLean, 1992), which reflected the different groups of stakeholders for their various interests and perceived outcomes. D&M (DeLone, 1988; Delone, 2003; DeLone & McLean, 1992) is a model constructed on information systems success theory. In this model use, and user satisfaction explain individual impacts, and individual impact explains organizational impacts. According to Star and Griesemer (1989) boundary objects' characteristics are flexible and adaptable to the environment and can also be tangible or intangible. According to their definition (Star & Griesemer, 1989), an e-learning system can be classified as a boundary object. The e-learning system concept has been changing over time. E-learning can be defined as learning that takes place partially or entirely over the Internet, making information or knowledge available to users discounting time restrictions or geographic proximity (Rosenberg, 2005). The e-learning concept is focused on the technological aspects of an information system, which enables diffusion of explicit and tacit knowledge in the form of virtual classes or digital synchronous classes.

E-learning can be studied in various scopes, including a technological scope, by focusing on artifacts, in other words, in a static point of view; or an interaction scope, by focusing on the relationships and impacts of these artifacts on different stakeholders' behaviors, within specific contexts. Going deeper into the concept of boundary object, the scopes of e-learning studies may be defined as a common space in which individuals interact through and within this space.

Star (2010, p. 603) clarified the concept of boundary object in the following way: "*an object is something people* (*or, in computer science, other objects and programs*) *act toward and with.*". In this sense, and in this study's goal, we focus on the individual interaction of students who use e-learning systems to accomplish their learning tasks, and we are also interested in the perceived success attained by different students of several universities.

This study is not at an organizational level, we are not addressing different organizational cultures, but are addressing different user approaches. Assuming that different e-learning platforms, *strictu sensus*, are not a panacea, it is important to understand if different individuals have different opinions and perceived outcomes when using computers as a learning mediator. In other words, it is relevant to understand if individualism/collectivism determines e-learners' success, although the reason for this study can derive from the need to capture a complex phenomenon, using a different method (Star, 2010). We are in the presence of what is called a "boundary infrastructure" (Bowker & Star,

1999). A boundary infrastructure is "*any working infrastructure* [that] *serves multiple communities of practice simultaneously be these within a single organization or distributed across multiple organizations*" (Bowker & Star, 1999, p. 313).

Although an e-learning system can be a boundary object, when we study the relationship between learners and the mediator technological platform, it can also be considered as a boundary infrastructure, when studying the mediated relationships between the various groups of e-learning stakeholders (students, teachers, and institutions, among others). As our main contributions, we first integrate the culture dimension with the D&M model, because culture differentiates the various stakeholder groups. This is the first study that integrates the impact of individualism/collectivism on individual and organizational impacts of e-learning systems. Another contribution of this article is the proposal of a theoretical model that includes a cultural dimension as direct and moderator effects on the D&M model. Individualism/collectivism is, therefore, associated with the way students learn and with the way they perceive performance. A more individualistic student may perform differently compared to a collectivist student. Therefore, individualism/collectivism contributes with a new insight on e-learning success. Our aim is to understand the main drivers of e-learning success. Data were collected through an online survey to which 323 university students responded. To understand the success determinants of e-learning systems, it is appropriate to adapt D&M (DeLone & McLean, 2003).

The next sections introduce the problem context and present the theoretical foundations of e-learning systems' success. In the third section, we propose a theoretical model for measuring learners' satisfaction taking into account the perceived individual and organizational impacts of e-learning considering the individualist/collectivistic factor. This is followed by the methodological approach. The fifth section contains the empirical study analysis and the results obtained. In the last two sections, we present the discussion and conclusions.

2. Theoretical foundations

2.1. E-learning studies

A number of authors have used IS models to study e-learning systems. Table 1 contains the constructs used in the various studies and the theoretical models used. It reveals that e-learning has been widely studied in the adoption phase, and we can see that technology acceptance model (TAM) is the most frequently used model in an e-learning context. D&M model (2003) has also been used in some studies. From the studies recorded, we observe that the D&M (2003) can be used in the context of e-learning systems' evaluation.

E-learning systems success' evaluation variables are organized into three clusters: first are those that refer to the implementation process (Cooper & Zmud, 1990; Kwon & Zmud, 1987), the second variables are of behavior perceptions (Davis, Bagozzi, & Warshaw, 1992; DeLone & McLean, 1992), and the third are those that belong to a performance dimension (DeLone & McLean, 1992; DeLone, 1988). Although DeLone & McLean's model has been used and verified in e-learning systems contexts, this model was constructed to evaluate IS in general.

We conclude that the majority of the studies address the adoption phase. Our aim will be to identify specific determinants of e-learning systems' success, which belongs to a post-adoption phase (Larsen, 2003). Other researchers have studied only technology characteristics and users' perceptions on actual use. However, the impacts of individual and cultural characteristics have not been studied deeply enough with regard to e-learning systems' success.

2.2. IS success measurement

Our goal is to understand the extent to which cultural characteristics affect e-learning systems' success. We reviewed the literature and found that e-learning has been studied in various phases of its cycle: adoption,