Satisfaction and continuous use intention of e-learning service in Brazilian public organizations

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A R T I C L E   I N F O

A B S T R A C T

The aim of this paper is to investigate the constructs of Technology Readiness Index (TRI) and the Decomposed Expectancy Disconfirmation Theory (DEDT) as determinants of satisfaction and continuous use intention in e-learning services applied in public organizations. The research was conducted by online survey in a sample of 343 employees of two public organizations in Brazil who have had e-learning experience. The results showed that quality, quality disconfirmation, value and value disconfirmation positively impact on satisfaction, as well as disconfirmation usability, innovativeness and optimism. Likewise, satisfaction proved to be decisive for the purpose of continuous use intention. In addition, technological readiness and performance are strongly related. The main contribution of this study is the delivery of an assessment tool for performance oriented to training courses at distance and applied in public organizations.

1. Introduction

The expansion of the Internet has contributed in popularizing various virtual platforms implemented in electronic services. One such these services, is e-learning. Kaplan and Leiserson (2012) introduce the concept of e-learning used by American Society for Training and Development's as a broad set of applications and processes, such as web based learning, using virtual learning environments (VLE). This definition is shared by others authors who research the topic (Derouin, Fritzsche, & Salas, 2004; Klering & Schroeder, 2011; Nicholson, 2007).

The e-learning finds applications in several areas, including distance education for primary and higher education, corporate training and training for government employees. Several models have been shown to be able to measure the satisfaction and continuous use intention of e-learning services. These aspects are essentials to determine the success of e-learning (Bolliger & Martindale, 2004; Chiu, Hsu, Sun, Lin, & Sun, 2005; Duque & Weeks, 2010;

Harfoushi & Obiedat, 2011; Lankton & McKnight, 2006; Liao, Chuang, Yu, Lai, & Hong, 2011).

However, few studies focus on the evaluation of online training for employees of public organizations (Erdogmus & Esen, 2011; Gelderman, Ghijsen, & Diemen, 2011; Hess, 2012; Langford & Seaborne, 2008; Lin & Hsieh, 2007; Rhee, Verma, Plaschka, & Kickul, 2007). Under Brazilian studies, the pattern is repeated, and there are few studies using this approach (Klering & Schroeder, 2011; Riss & Grohmann, 2011).

In Brazil, the increasing of distance courses has shown to be significant since the year 2000. From 2000 to 2009, the number of distance courses rose from 13 to 844. It is estimated that there is involvement of more than three million users (Abraead, 2008). One of the causes for this increase was the institutionalization of the National Policy on Staff Development, established by Decree 5707 to February 23, 2006 (Brasília, 2006), which emphasizes distance learning with the use of VLEs for government employees.

Among the theoretical models that assess the users' perspective on distance learning courses, two of them have the potential to be applied in public organizations. One is the Technology Readiness Index (TRI), developed by Parasuraman (2000) and, the Decomposed Expectancy Disconfirmation Theory (DEDT), developed by Chiu et al. (2005). TRI consists of a tool that checks pre-disposition

to use certain technology (Parasuraman, 2000; Ling & Moi, 2007; Erdogmus & Esen, 2011; Lai, 2008; Summak, Baglibel, & Samancioglu, 2010). The DEDT assesses the expectations and performance, in context of e-learning, being created specifically for this technology (Chiu, Wang, Shih, & Fan, 2011; Chiu et al., 2005; Kim, Trimi, Park, & Rhee, 2012; Liao et al., 2011). Such models allow the user to assess their own performance in the use of VLE, and encourage public employees to use technological tools of strategic potential, contributing to increased productivity and modernization of public organizations (Langford & Seaborne, 2008; Pereira, Ramos, Andrade, & Oliveira, 2011; Pereira, Ramos, & Chagas, 2011; Saha, Nath, & Sangari, 2010).

The objective of the research is to identify factors that influence satisfaction and continuous use intention of e-learning services. Additionally, a theoretical model through structural equation modeling that measures satisfaction and continuous use intention of e-learning services in Brazil will be validated. The theoretical model that will support this research uses TRI and DEDT together, being unprecedented in the literature. The main hypothesis of the study is that there are significant relationships between performance in e-learning course and satisfaction with it and between satisfaction and continuous use intention of this kind of service.

The presence of e-learning in public organizations is important to show the need for continued development of employees, dissemination and management of training activities, rationalization and effectiveness of spending on training, adequacy of skills of employees to goals of institutions and improvement in services for citizens (Brasília, 2006; Saha et al., 2010). Through the use of theoretical model such as TRI and DEDT it is possible to verify if the users take advantage of the potential technological and the actual performance in the courses offered, increasing productivity and reducing public spending.

2. Literature review

This topic addresses the theories that underpin research model and hypothesis: the TRI and DEDT. Considerations about the presence of e-learning in Brazilian public organizations are also made.

2.1. Technology Readiness Index (TRI)

Developed by Parasuraman (2000), TRI serves as an instrument to measure consumer technology readiness, therefore, is the provision that the consumer has to use certain technology (Hu, Kuo, & Lin, 2010; Richey & Autry, 2009). This theory was developed in order to verify the behavior of consumers facing technology-based services (Summak et al., 2010). However, the TRI was being applied in different organizational contexts, such as in public organizations and technology services in education (Rhee et al., 2007).

The original scale developed by Parasuraman (2000) consists of 36 items, divided into four constructs. In the context of e-learning, TRI has been gaining ground, especially by its scope, have constructs that seek to understand possible resistance to the use of technologies by different classes of users (Ismail, Azizan, & Azman, 2011; Rhee et al., 2007). In Table 1 some studies that apply the TRI in the context of e-learning are summarized.

2.2. Decomposed Expectancy Disconfirmation Theory (DEDT)

The DEDT was conceived from the Expectancy Disconfirmation Theory (EDT), (Oliver, 1980). The EDT was originally developed from models of cognitive perceptions of consumers before purchase and consequences of initial perceptions influencing the reuse or disuse of the product or service. It is a model of consumer behavior where customer satisfaction is co-determined by the expectation disconfirmation (Liao et al., 2011; Roca, Chiu, & Martínez, 2006). In the model adapted to e-learning services, titled DEDT (Chiu et al., 2005), disconfirmation can influence the immediate satisfaction of the user. The disconfirmation is the degree to which performance meets or not the individual expectations (Liao, Chen, & Yen, 2007; Oliver & Swan, 1989).

A series of previous studies confirms the predictive ability of EDT in the context of continuance intention in technology-based services (Chou, Min, Chang, & Lin, 2010; Liao et al., 2011; Chou, Lin, Chung, & Tsai, 2012). Noteworthy is the use of EDT in the context of user loyalty, in relation to online tourism services (Serenko & Stach, 2009), evaluation of benefits brought by an integrated management model (Estevez, 2005), user satisfaction in online bank services (Bhattacherjee, 2001a), consumer satisfaction in e-commerce channel (Devaraj, Fan, & Kohli, 2002), among others. The individual's satisfaction with the product or service is the condition for repurchase. This in turn, is related to the degree of the expectations that the individual has, at the beginning of the consumption process. Thus, the expectation is configured as an additional determinant of satisfaction (Bhattacherjee, 2001a; Paechter, Maier, & Macher, 2010). Table 2 presents studies on this topic with applications in e-learning.

2.3. E-learning in public organizations

Access to web-based learning has become a key factor in retaining quality to public sector employees (Langford & Seaborne, 2008). The e-learning when inserted in public organizations contributes to be a vehicle to meet organizational objectives, to encourage the use of new technologies and to improve the service provided to citizens (Langford & Seaborne, 2008; Saha et al., 2010).

The TRI has been used as a measure of scale of technological readiness, including studies about e-learning (Lai, 2008; Ling & Moi, 2007; Rhee et al., 2007; Summak et al., 2010). Studies in Brazilian public organizations such has contributed to enlarge the TRI applications in the context of e-learning. Likewise, the model EDT has demonstrated efficacy in evaluating systems on the internet and consequently in VLEs (Chiu et al., 2005, 2011). The EDT model also demonstrates utility when applied to public organizations under the perception of citizens about government performance (Gregg, 2006; Oliver, 2009).

Several researches and proposals adapted for new models presented an approach that related the constructs or combined tested models, as in the study to Erdogmus and Esen (2011), joining Technology Acceptance Model (TAM) and TRI, Roca et al. (2006) and Lin (2011), using EDT and TAM, Liao et al. (2007), using EDT and Theory of Planned Behavior (TPB), among others. However, EDT and TRI have no applications together in the context of e-learning in public organizations.

As causes of the lack of studies using the fusion of TRI and DEDT, the main one is the focus on the adoption and acceptance of e-learning, being more appropriate when applied to education (Akbar, 2013; Alwahaishi & Snášel, 2013; Kocaleva, Stojanovic, & Zdravev, 2014; Marques, Villate, & Carvalho, 2011). Theoretical models such as TAM, UTAUT and IDT focuses on acceptance/rejection of new technologies (Hsu, 2012; Oye, Iahad, & Nor, 2012; Tan, 2013). The focus of this study is the satisfaction and continuous use intention, from antecedents linked to the use of VLE. The scarcity of e-learning services evaluation that is focused on satisfaction and continuous use intention is also due to lack of applications in public organizations. Other difficulties in adapting TRI and DEDT together consists of the increased complexity of the model to be tested, requiring the use of statistical methods for validating scale, specification research and the use of 2nd order factors (Kline, 2005; Maroco, 2010).