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Users' intrinsic and extrinsic drivers to use a web-based educational environment

Manuel J. Sánchez-Franco*, Begoña Peral-Peral, Ángel F. Villarejo-Ramos

Universidad de Sevilla, Avda. Ramón y Cajal n1, Sevilla, 41018, Spain

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ABSTRACT

The aim of this study is to gain further insight into the drivers that help in the design of desirable web-based educational environments. The specific objectives are twofold: (1) to explore the main drivers of learners' responses, in terms of their ongoing patronage and recommendation of learning tools to others; and (2) to clarify the significance of exploratory behaviour as a moderator that contributes to users' e-loyalty. Drawing on the fields of design, non-economic satisfaction, and e-loyalty, this quasi-experimental study hinges on analysis of survey data to assess college students' online usage experiences. Aesthetics and usefulness have significant effects on perceptions of the extent to which students' goals and desires are met, and, by extension, extrinsic outcomes and e-loyalty. Making an educational tool simpler to use, however, has hardly any effect on users' perceptions of its usefulness. Furthermore, when usage is more instrumental, expressive issues weaken users' satisfaction-based processes. Our research also indicates that individual differences based on variety-seeking personality traits play an important role in users' decisions to accept e-learning tools. This article may therefore act as a springboard for further empirical research, as well as clarifying and examining the nature of e-learning tools' enduring usage amongst college students.

1. Introduction

Learners should make active use of electronically-supported learning tools to provide real benefits in their learning processes. Active (and long-lasting) use of these tools would also help to justify universities' investment in information technologies (ITs)—an important consideration given these institutions' scarce financial resources (Alsabawy, Cater-Steel, & Soar, 2013; Cheung & Huang, 2005). The challenge for advocates of e-learning is thus to transform the role of individuals from passive (and occasional) recipients of information to active (and enduring) participants in knowledge acquisition (Wojciechowski & Cellary, 2013). Instructional designers are indeed seeking alternative instructional delivery solutions to improve convenience and effectiveness for individual and collaborative learning (Wu, Tennyson, & Hsia, 2010). Exploring key predictors of the adoption of ITs, and understanding the conditions under which ITs are accepted and used by learners takes on great importance (Escobar-Rodriguez & Monge-Lozano, 2012). The intention to continue using such systems is still very low (Lee, 2010).

Our study combines previous research on electronically-supported learning tools by using a human–computer interaction (HCI) (*e.g.*, Porat & Tractinsky, 2012; Zhang & Galletta, 2006) and a marketing framework based on the relationship quality model (*e.g.* Crosby, Evans, & Cowles, 1990; Dwyer, Schurr, & Oh, 1987). We assume that the ultimate success of interactive tools equates to long-lasting usage, and emphasises the predictive power of previous loyalty-based models by examining additional constructs related to the evaluation and implementation of computing systems for human use. The success of e-learning tools hinges on ensuring that learners not only visit an electronically-supported learning environment but also return to it. Calls are growing for research that would specifically help us understand the nature of non-economic satisfaction as a major marketing driver to predict the building of electronic loyalty (hereinafter, e-loyalty)

* Corresponding author. Tel.: +34 954557504.
E-mail addresses: majesus@us.es (M.J. Sánchez-Franco), bperal@us.es (B. Peral-Peral), curro@us.es (Á.F. Villarejo-Ramos).

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(Anderson & Srinivasan, 2003; Bloemer, Kasper, & Lemmink, 1990; Cuthbertson, 2001; Evanschitzky, Iyer, Hesse, & Ahlert, 2004; Fornell, 1992; Gommans, Krishnan, & Scheffold, 2001; Oliver, 1999; Schultz & Bailey, 2000; Szymanski & Henard, 2001), and consequently, users' loyalty in electronic settings – closely associated with learners' responses to learning tools and their ongoing patronage (Hsu, Wu, & Chen, 2013).

However, a permanent increase in individuals' satisfaction is becoming difficult to achieve (*cf.* Homburg, Wieseke, & Hoyer, 2009). Scholars search for additional ways to determine the chain of influence running from major drivers all the way to the behavioural intention to use e-learning technology. Although the technology acceptance model (hereinafter, TAM; *cf.* Davis, 1989, 1993; Davis, Bagozzi, & Warshaw, 1992) successfully forms the basis of many studies in the adoption of information technology, it fails to address external factors that may influence other motivators (Cheung & Huang, 2005). In our research, we aim to extend TAM by examining its antecedents based on computing systems for human use. It is essential for designers to understand the dimensions and moderators that drive learners' acceptance and continuing interaction at a deeper level.

On the one hand, technology acceptance relies on developing e-learning tools that employ HCI drivers. Scholars often disregard the role of visual design in the electronically-supported learning domain due to the current perceptions in the field and traditional learning methodologies. In response to this gap in the literature, the objective of this research is to illustrate the essential role of visual design-based drivers in the enduring acceptance of virtual learning tools. Along these lines, Yang and Yoo (2004) propose expanding TAM by considering both the affective and cognitive dimensions of attitude. Visual experiences of interaction-based educational tools based on an artistically beautiful or pleasing appearance (*i.e.*, visual aesthetics; *cf. American Heritage Dictionary of the English Language*) are important determinants of whether learners to use an IT tool again. Although instructional designers traditionally neglect the potential impacts of visual aesthetics, and view emotional design as a superficial task (Miller, 2011), aesthetics is a growing issue in the HCI literature.

On the other hand, for an audience to perceive an e-learning tool as useful, the design of an environment must embrace a *trade-off* between usefulness and aesthetics. Focussing solely on the artistically beautiful or visually pleasing appearance of e-learning tools is inadequate to cover all facets of this usage experience. Our thesis is that the success of e-learning tools also depends on users' perceptions of functional utility. A learning designer should be able to enhance perceived usefulness either by adding new functional capabilities to e-learning tools, or by making it easier to employ the learning and teaching functions that already exist within the tools. Although there have been significant advances in visual design in HCI, plenty of unanswered research questions still remain (*e.g.*, Hassenzahl, 2004, 2008; Sánchez-Franco & Martín-Velicia, 2011; Sauer & Sonderegger, 2009).

Finally, individuals react differently to the online environment, depending on their personal characteristics. Authors of technology acceptance studies in contexts other than e-learning point out that perceived ease of use and perceived usefulness are influenced by individual differences, defined as an enduring pattern of reactions and behaviours when faced with similar situations (*cf.* McCrae & Costa, 1999). As per previous research exploring the role of personality traits in the usage of online environments (*e.g.*, Lu & Hsiao, 2010; Ross et al., 2009), the variety-seeking personality trait related to exploratory behaviour is one of the key variables to analyse.

In particular, we analyse the importance of personal determinants in ensuring user loyalty, from a relational point of view, so as to gain a better understanding of the potential means of integrating learners into an electronically-supported learning tool. Although previous research shows that individual traits play an important role in users' decisions to accept or reject technologies (*cf.* also UTAUT, *User acceptance of information technology: Towards a unified view*; Venkatesh, Morris, Davis, & Davis, 2003), scholars neglect to analyse the significance of variety-seeking personality traits (as a moderator) in contributing to e-loyalty. Insights into the role and importance of these factors help designers understand the reasons for differences between the performance levels of learning and loyalty amongst learners.

To sum up, the empirical value derived from an integrated model that combines relationship quality and HCI has scarcely been examined. Visual design and personal traits related to electronically supported learning and teaching are both important. However, these two aspects are usually not systematically integrated into a single model. Therefore, the purpose of this research is to perform a thorough examination of the relationships between visual aesthetics, perceived usefulness, satisfaction, and loyalty in the context of e-learning environments. We also analyse whether the exploratory behaviours of learners moderate the influences of visual design in a loyalty-based model. This paper addresses these questions, and outlines the managerial implications, limitations and directions for future research.

2. Literature review and theoretical background

Prior studies traditionally examine TAM and relationship quality independently when explaining the use of interaction-based tools. Merging these contrasting disciplines into a new research model is challenging in terms of both research and empirical analysis (Porat & Tractinsky, 2012). We do so by considering the whole user experience, combining intrinsic and extrinsic drivers. The following dimensions form the basis of this research.

2.1. Visual aesthetics

In online learning, it is essential for educational institutions and faculties to consider the function of visual aesthetics (hereinafter, aesthetics) in learners' feelings towards educational tools. Although instructional designers of e-learning tend to overlook aesthetics and the emotional influence of design (Hokanson & Miller, 2009; Miller, 2011; Miller, Hokanson, Doering, & Brandt, 2010; Parrish, 2005; Wilson, 2005), interactive systems are an important way for managers and users to create, use, and intensify high-quality experiences, of which visual aesthetics forms an essential part (*cf.* Sheng & Teo, 2012; Van Schaik & Lin, 2009).

Aesthetics is now one of the most important keys of users' affective experiences and their emotional bonds (Hassenzahl & Tractinsky, 2006; Kim, Kim, & Kandampully, 2009; Tractinsky, Katz, & Ikar, 2000; Wolfinbarger & Gilly, 2003, amongst others), and long-term relationships (Kim et al., 2009; Sánchez-Franco & Rondán, 2010; Schenkman & Jönsson, 2000). On the one hand, users seek fulfilment and deep emotional stimulation when using interactive systems. Affect could be pre-attentively extracted and could influence subsequent perception (*e.g.*, Dion, 1973; Eagly, Ashmore, Makhijani, & Longo, 1991; Fazio, Roskos-Ewoldsen, & Powell, 1994, amongst others). If learners find online appearances visually pleasing or aesthetically satisfying, both their state of mind and first impressions are likely to be favourably