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Factors influencing students' use of a library Web portal: Applying course-integrated information literacy instruction as an intervention

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ABSTRACT

This longitudinal study investigates factors influencing undergraduates' prior, current, and continued use of a university library Web portal using a credit-bearing course infused with information literacy (IL) components as an intervention. Applying a mixed methods approach and using the technology acceptance and information systems success models as theoretical foundations, the authors examined direct influences of user satisfaction, voluntariness, and competing resources on portal usage, as well as relationships among current use, user satisfaction, and continued use. The results indicated that the positive effect of user satisfaction on use increased and the unfavorable impact of voluntariness of use became non-significant after the intervention. Yet, the significant negative impact of competing resources on portal use remained unchanged. Additionally, current use had a significant positive relationship with user satisfaction which led to continued use. The outcomes signify that integrating IL components into credit courses could be a strategy to facilitate library portal use.

1. Introduction

In the digital age, disseminating and obtaining information online have become standard practices. Universities have made substantial investment in electronic resources and made them available through information gateways for digital content and library services, commonly called library Web portals. Library Web portals can be complex and students often prefer to use popular Internet search engines (e.g., Google) instead for their academic work (Low, 2003), resulting in the underutilization of library electronic resources (Hong, Thong, Wong, & Tam, 2002; Thomsett-Scott & May, 2009). Given the voluntary nature of library Web portal use and the availability of competing resources, existing technology acceptance models (Davis, Bagozzi, & Warshaw, 1989; Venkatesh & Davis, 2000) and information systems (IS) success models (DeLone & McLean, 1992, 2003) may not be directly applicable in identifying factors influencing students' use of library Web portals.

The role of user training in the acceptance and use of information technology and educational applications has been widely discussed (e.g., Escobar-Rodriguez & Monge-Lozano, 2012; Giannakos, 2013; Mariani, Curcuruto, & Gaetani, 2013) and proven to enable users to recognize the usefulness of technology, thus prompting an intention to use (e.g., Robinson, Marshall, & Stamps, 2005; Wu, Li, & Tsai, 2013). Library Web portals can require training to familiarize and encourage users to

exploit the technology to its full potential. Many higher education institutions offer information literacy (IL) courses that introduce students to technology and online information resources available from their library Web portals to facilitate learning, teaching, and research with reliable and scholarly information as well as services. However, no research has been conducted to examine students' use of library information systems after having taken credit-bearing IL courses as an intervention. The relationships between students' current use of an information system, their satisfaction with it, and continued use over time also remain unexplored.

To fill this void in the literature, the authors initiated this longitudinal study applying Venkatesh and Davis (2000) extended technology acceptance model (TAM2) and the IS success model (DeLone & McLean, 2003) as theoretical foundations. The population was undergraduate students enrolled in a 3-credit, semester-long, IL-integrated general education course on "Internet and Information Access" (hereafter referred to as IL Course) at a mid-size research university in the United States. The course content included an introduction to the Internet and World Wide Web, Internet security, information literacy in technology and online information resources, as well as using, finding, evaluating, and producing information on the Internet. Part of this course introduced students to the UL Web portal, teaching them how to use library resources, such as the online public access catalog, electronic databases, and library tutorials for their research and assignments. In addition to lectures, the course instructor demonstrated Internet and Web searching techniques and strategies. A series of assignments was designed to prepare students for the final research project which consisted of a critique of a library research database, and an

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annotated bibliography on an information-related topic. These assignments involved identifying authoritative Web pages; looking up books in the library catalog; and using research databases to find scholarly articles, online reference sources, and newspaper articles.

The authors conducted surveys and interviews to investigate the determinants of students' use of the University Libraries' Web portal over time, as well as to explore the interplay among use, user satisfaction, and continued use. The results of this study may shed some light on the problem of the underutilization of resources and services on university library Web portals, which, in turn, could help library professionals improve their Web presences and enhance services delivered via their portals.

2. Theoretical frameworks and research models

2.1. Theoretical frameworks

2.1.1. Technology acceptance models (TAMs)

According to TAM (Davis et al., 1989), perceived usefulness (PU) and perceived ease of use (PEOU) are the two dominant factors that determine a person's attitude toward using an information system, leading to actual system usage. Because external variables can also influence user beliefs, TAM2 (Venkatesh & Davis, 2000) further hypothesizes that constructs such as subjective norm, job relevance, output quality, and PEOU can directly or indirectly affect PU and the intention to use an information system (Fig. 1). Venkatesh and Davis observed that *experience* and *voluntariness* had significant moderating effects on how a user's perception of subjective norm affected his/her intention to use.

Researchers have evaluated the TAM models in various settings, including libraries in higher education (e.g., Heinrichs, Lim, Lim, & Spangenberg, 2007; Kim, 2006, 2010). Using TAM2 (Venkatesh & Davis, 2000) as the theoretical framework, Kim (2006) examined factors influencing the acceptance of Web-based subscription databases by undergraduate students at a large university. The study results indicated that PU had a greater positive impact on intention to use than PEOU. Expanding the scope of Kim's research on databases, Kim (2010) explored the use of university library Web site resources by undergraduates, graduates, and doctoral students/faculty at four universities. The outcome revealed that the model had the most explanatory

power when predicting undergraduate students' usage. Additionally, PU remained to be a significant factor for intention to use. Heinrichs et al. incorporated service functionality and task functionality into the TAM model to examine usage of an academic library Web site. Their results showed that PEOU, PU, and service functionality offered on the library Web site demonstrated a strong significant positive relationship with satisfaction. Additionally, PU and user satisfaction exerted a direct positive impact on intention to use.

As influential as they are, however, TAM (Davis et al., 1989) and TAM2 (Venkatesh & Davis, 2000) did not take into consideration the possible impact of competing information resources/systems on an individual's adoption of a target system. For example, in the current study, undergraduate students might perceive the University Libraries' (UL) Web portal to be useful and feel comfortable using it after taking the IL Course. However, whether the ready availability of Internet search engines (e.g., Google) and public Web portals (e.g., Yahoo!) would mitigate the students' PU of the portal and the effects of the instruction on their actual use remains to be investigated. Also, a student's use of the UL Web portal can be mandatory, or voluntary, or a combination of both depending on instructors' stipulations. Thus, the influence of this unique setting on the actual use of the UL Web portal over time deserves examination.

Additionally, TAM offers little insight into how to leverage system design and implementation to enhance PU and PEOU and thereby influence usage (Venkatesh, Morris, Davis, & Davis, 2003). In their TAM3 model, Venkatesh and Bala (2008) posed a research agenda on potential pre- and post-implementation interventions that can boost system usage. This study differentiates itself from prior research in that the intervention is a credit-bearing, semester-long IL course carefully designed to foster positive user perceptions, as opposed to the more common library instructional approach of offering one-time training sessions. Its longitudinal nature allows for examining whether the course-related instruction facilitates current use, as well as the dynamic relationships among current use, satisfaction, and continued use.

2.1.2. The IS success models

Along with the technology acceptance models, information systems success models (e.g., DeLone & McLean, 1992, 2003; Seddon, 1997) represent another research stream investigating user satisfaction and
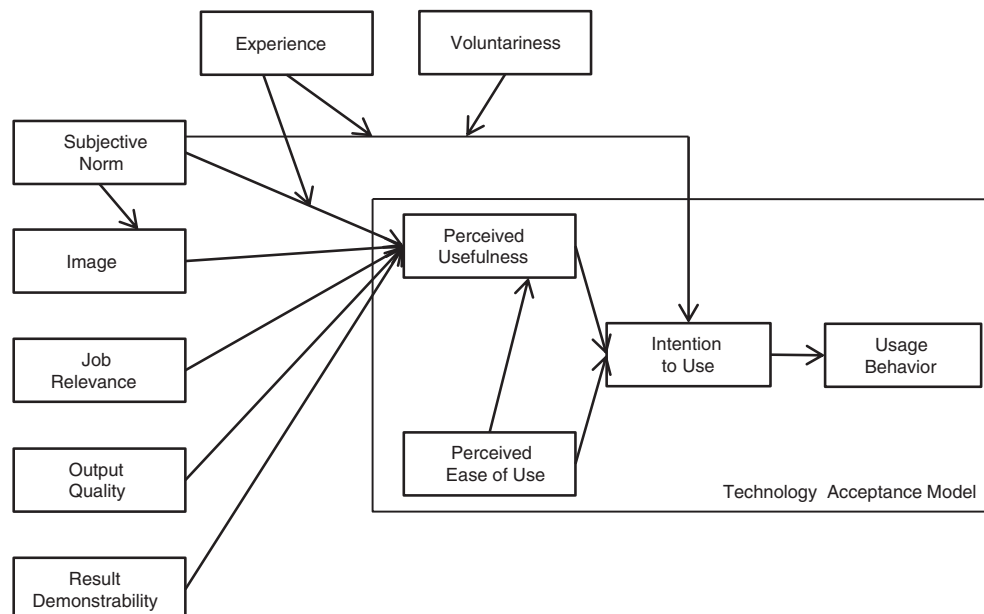

Fig. 1. TAM2 — extension of TAM (Venkatesh & Davis, 2000, p. 188).