Computers in Human Behavior 55 (2016) 340–353

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Full length article

A multi-analytical approach to predict the Facebook usage in higher education

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ARTICLE INFO

Article history:
Received 5 June 2015
Received in revised form
6 August 2015
Accepted 21 September 2015
Available online 29 September 2015

Keywords:
Facebook
Social media
Structural equation modeling
Neural network
Higher education
Oman

ABSTRACT

Socio constructivist approach has an important say in cognitive absorption of learning in a student's life. This era of social networking services has given substantial importance to collaborative nature of learning, thus supporting Vygotsky's socio constructivist approach. The aim of this paper is to predict key determinants that affect students' intention towards academic use of Facebook. The usable data were gathered from 215 Omani students, and multi-analytical methods were employed to test the proposed research model. The results obtained from structural equation modeling (SEM) showed that resource sharing is the most influencing determinant in the decision of Facebook usage in higher education, followed by perceived usefulness, perceived enjoyment, collaboration and social influence. Further, the results obtained from SEM were used as input to the neural network model and results showed that collaboration is the most important predictor of Facebook adoption for academic purposes followed by, resource sharing, perceived enjoyment, social influence, and perceived usefulness. The findings of this study can be used to enhance the use of social media tool like Facebook for teaching and learning purposes. This is the first study which analyzed Facebook adoption for academic purposes by using a linear and nonlinear modelling. Theoretical and practical implications are discussed.

1. Introduction

The advent of web 2.0 has laid the foundation for creating and sharing contents with Internet users. Facebook is an integral part of web 2.0. Vygotsky, the champion of socio-constructivist perspective recognized the importance of cultural and social context for all round cognitive development and postulated his theory of 'zone of proximal development' keeping in mind that 'learning is a social development' (Kozulin, 2003). It is important to highlight that in the present scenario, the educators and the researchers strongly promote socio-constructivist model for learners and recognize communication and interaction as a significant pedagogical tool of educational practices (Dawson, 2006). Various genres of communication are considered under this agenda: student–instructor communication, student–student communication, student–communities' communication etc. Various modes of these communications are also recognized as noteworthy such as: face to face (classrooms), research exchange programs (conferences and seminars), publications, online (blogs, chat rooms, posts on Social Network Sites (SNS)) etc., the later mode gaining prominence day by day. This rise in interactive modalities ultimately augmented the study of student interaction with faculty as well as with student communities (Beaudoin, 2002). Besides SNS, Massive Open Online Courses (MOOC) technology is also being used as a new online educational model. MOOC is implemented by several academic institutions. The concept behind this technology is to provide (almost free) online contents with extra features such as search capabilities, online communication, group work, and networking to millions of users (specifically students) around the world (Allison, Miller, Oliver, Michaelson, & Tiropanis, 2012). Although, MOOC is not designed for all types of students and academic institutions because of its business model (Hyman, 2012; Martin, 2012). Another study on MOOCs found that socialization via MOOCs was considered as important factor by users, which was quite a challenge in MOOC (Mackness, Waite, Roberts, & Lovegrove, 2013). Online teaching environment is also referred to as a provider of richer experience to students because it offers various roles to learners under diverse situations. The virtual learning space-key

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http://dx.doi.org/10.1016/j.chb.2015.09.020
0747-5632/

element of collaborative construction knowledge, was found to be multi-facet cognitive system where students were proactive and their aptitudes were on different levels-participants, contributors etc. while comparing constructivist environment and virtual environments (Dillenbourg, Schneider, & Synteta, 2002). In keeping with the wide acceptance of online learning prospective, Social Network Services emerged on the horizon in the late twentieth century (Ellison & Boyd, 2013). There was initial hesitation but not a complete denial to accept Social Media as a mode to learn and teach. As Fritsch (1998) studied that knowledge accumulates in the 'central system' of a student and similar is the case with Internet learning. As the time passed, single handedly Social Network Services pulled all the attention to itself. Social Networking Sites (SNS) viz. Twitter, Facebook, Instagram, Google+ etc. have gained immense popularity with the today's generation including students and teachers. Thus, there is a wide scope of research in this field to modify the educational approaches adopted by academicians in the near future. Kimmons and Veletsianos (2014) emphasized on the fact that because of such important status, SNS have attracted policymakers to generate regulations in order to control the results and effects.

In spite of numerous SNS, Facebook has the widest range of research prospective considering its extensive approach. As per December 2014 statistics, Facebook had 890 million daily active users on average, whereas, 1390 million monthly active users (www.socialbakers.com). Social networking sites are becoming more active in the Middle East region. 88% of the Middle East population uses social networking sites daily. Usage rate among the most popular social networking sites, Facebook 94% followed by Twitter 52% and Google+ 46% (www.go-gulf.ae/blog/social-media-middle-east/#). Oman, one of the Middle East countries, lies in the Arabian Peninsula. The total population of Oman in 2014 was 3,219,775. In May 2015, there were 5,48,940 Facebook users in Oman out of which 93,320 were added within last six months. Seventy two percent were male and twenty eight percent were female Facebook users. Moreover, if we look at the age distribution of Facebook users in Oman, it is interesting to note that forty four percent of the Facebook users are in the age group of 25–34 years, which was closely followed by 18–24 year age group (http://www.trademaxoman.com/ProductsServices/PaymentGateway/InternetMarketingTrendsMiddleEastt/OmanFacebookUsageStatistics.aspx). Facebook.com was created in the year 2004 with the mission to provide a common place on the web world where people can make friends, stay connected, discover & share things of their interests (www.facebook.com). Facebook is currently available in 70 different languages with its Arabic version launched in 2009. Facebook has covered this mission in all possible ways by substantial erosion of borders and margins of the society. With the maximum numbers of users, Facebook is a platform where students and teachers share same social arena. Any educational approach will be more personalized and accessible here and shall be more acceptable too (Towner & Munoz, 2011). Hence, it is evident that a research based education approach via Facebook will be highly effective and comprehensive for today's students. A cross-sectional relationship between Facebook and education is yet to be exploited, but initial studies shows vast potentials of pedagogical encounters. Facebook has immense potential to create student communities based upon their common interests. In a nutshell, research based upon Facebook educational prospective has huge demands by institutions looking for innovative teaching practices (Kolek & Saunders, 2008). Zhang, Wang, de Pablos, Tang, and Yan (2015) mapped the development of social media study. One of the important findings of this study concluded that most important topics in social media study included "internet", "communication", "Facebook" and hottest ones were "Facebook", "education" and "media".

The aims of this study are in three folds. First, explore determinants that influence students' intention to adopt Facebook in higher education. Second, incorporate appropriate determinants from the literature and propose a new hybrid model for adoption of an innovative technology in an academic domain. Third, it integrates empirical modeling methods for prediction purposes using explanatory and predictive modeling methods (Shmueli & Koppius, 2010). The majority of empirical studies (Al Omoush, Yaseen, & Alma'Aitah, 2012; Gruzd, Staves, & Wilk, 2012; Milosevic, Zivkovic, Arsic, & Manasijevic, 2015; Mazman & Usluel, 2010; Paul, Baker, & Cochran, 2012; Sanchez, Cortijo, & Javed, 2014) in Facebook adoption employ explanatory methods such as structural equation modelling (SEM) and multiple linear regression. This is the first study to analyze factors recommended by proven models (TAM, UTAUT and etc.) for social media (Facebook) adoption by learners using a linear and nonlinear modelling. Unlike past studies, this study employed SEM to test proposed research hypotheses and results obtained from SEM were used as an input variables to the neural network model to predict students' intention towards Facebook adoption in higher education in a developing country like Oman. Therefore, this study proposes to develop and test a hybrid model with better predictive ability to understand Facebook usage in academia. The following sections of this paper include: literature review with table of key studies on technology adoption by researchers, followed by research hypothesis, research methodology and discussion based on research findings. Remaining sections include conclusion and its implications followed by limitation and future research scope complete the paper.

2. Literature review

2.1. Background of TAM and related models

Researchers in the past developed various models and theories. Diffusion of Innovation (DOI) theory, one of the oldest models, addressed the significance of diffusion of a new idea or technology among the members of a social system over the time (Rogers, 1983). According to DOI theory, individual's decision to accept new technology or innovation is guided by factors – relative advantage, compatibility complexity, triability and observability. Davis (1989) discovered technology acceptance model (TAM) and described two major determinants-perceived usefulness (PU) and perceived ease of use (PEOU) to predict technology acceptance and its usage. Information System (I/S) Success Model by DeLone and McLean (1992) recommended the complete and organized taxonomy which suggests six key determinants for I/S Success. These determinants are-system quality, information quality, use, user satisfaction, individual impact and organizational impact. Unified Theory of Acceptance and Use of Technology (UTAUT) model proposed by Venkatesh, Morris, Davis, and Davis (2003) addressed four key constructs to explore user's intention and system use. UTAUT is an integrated model considering the elements of various IT acceptance research models, later Venkatesh, Thong, and Xu (2012) extended their UTAUT model and proposed UTAUT2 which measures fun, enjoyment and entertainment to explore user's intention and system use. Technology acceptance model (TAM) is an extension of theory of reasoned action (TRA) model introduced by Ajzen and Fishbein (1980), has been widely applied by various researchers (Chen & Tseng, 2012; Chen, Yang, Tang, Huang, & Yu, 2008; Mohammadi, 2015; Sharma & Govindaluri, 2014; Shyu & Huang, 2011; Tarhini, Hone, & Liu, 2014; Venkatesh & Davis, 2000) to examine the factors that influence user's decision and/or intention driving from his/her perception to adopt and use technology (e.g. e-learning) for different purposes. Related studies on