Adoption of Web 2.0 tools in distance education

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Abstract

This study has two purposes. First is to explain possible educational utilization of Web 2.0 tools, namely blogs, wikis, podcasts and social networks, from the point of importance of interaction for distance education. The second purpose of this study is to investigate adoption process of Web 2.0 tools in distance education by defining theories and models which have different construct that effect this process. Because the nature and structure of both distance education and Web 2.0 include multifaceted and dynamic variables, the limitation of utilization from only single diffusion, adoption or acceptance model or theory is underlined and it is proposed to handle a holistic view or using different models and theories suitable for research variables.

Keywords: Diffusion; innovation; acceptance; distance education; Web 2.0;

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Introduction

In distance education which is which is the basis of different learning forms as e-learning, web based learning, online learning and virtual learning, providing interaction has always been an important issue. In many researches, significance of interaction has been underlined and necessity of different interaction forms (student-teacher, student-student, student-content etc.) has been revealed by different technologies for quality of learning, satisfaction of students, eliminating isolation feeling and effective learning outcomes (Daunt, 1999; Brady, 2004; Su et al., 2005). Technology plays a key role especially for promoting interaction, delivering education and providing communication between individuals. Keegan (2006) explained that distance learning systems use technology to separate learner from the teacher and learning group while maintaining the integrity of education process and attempting to replace the interpersonal communication and the inter subjectivity which is the essence of education transaction between teachers and taught by a personal form of communication mediated by technology. Interaction in distance education is not limited to audio and video, or solely to teacher-student interactions, it must also represents the connectivity, the students' feel with the distance teacher, aides, peers etc., otherwise without interaction students become autonomous, isolated and procrastinates and drops out (Sherry, 1996). As a matter of fact, emerging technologies and changing pedagogies bring out the necessity for more effective two way communication, promoting interaction and collaborative working, sharing and flexible participation

Web 2.0 Tools in Distance Education

The first used technologies, radio, tv, one way video conferences, e-mail, discussion forums etc, provided a communication between users, however, they were lack of effective interaction and collaboration. Users were passive consumers of content with these tools as many of them have been called Web 1.0. To fulfill the shortages of Web 1.0 and to provide more effective interaction and collaboration, investigation for the ways of using blogs effectively, wikis, podcasts and social network in education has been started. The main characteristic of these tools called Web 2.0, is users' active participation in the content of creation process. In studies of learning and teaching, as well as efficacious evolution of technology, importance of active participation, critical thinking, social presence, collaborative learning and two way communications are also underlined for quality learning (Beldarrin, 2006). However, necessity

of collaborative technology that leads the student toward achieving desired learning outcomes, requirement for flexible models that allow designers to begin at any given point in the process and purpose of technology using in the instructional design framework show that emerging technologies have an impact on new models of teaching and new ways of learning in distance education (Beldarrain, 2006).

It is suggested that by the interactive technologies and medias which are provided by Web 2.0, support these pedagogic approaches (Ferdig, 2007).

The most common tools of Web 2.0 including blog, wiki, podcast and social network are discussed.

Blog: Blogs are also called online diaries which enable users, without requirement of any technical skill, to create, publish and organize their own web pages that contain dated content, entries, comments, discussion etc. in chronological order (Alexander, 2006; Castenade, 2007). People can publish information which they collect from various resources and establish relation between them in blogs. Additionally RSS and the possibility to post comments make blogs also a collaborative and social-interactive software application (Petter et al., 2005).

As blogs are very easy and flexible tool for using, they are being utilized in various fields with various purposes. Especially, since blogs have various educational advantages, number of researches and studies in educational usage of blogs increased. It is suggested that blogs enhance writing skills, facilitate reflecting themselves, encourage critical thinking with collaborative learning, and provide feedback and active learning (Seitzinger, 2006). Blogs are well suited to serve as online personal journals because they enable students sharing files and resources and publishing blogs on the Internet and students has the possibility of writing for reader beyond classmates (Godwin, 2003). In addition, blogs can be used as e-portfolios that keep records of personal development process, reflections and achievement (Lu, 2007).

Wiki: According to Leuf and Cunningham, creators of the original wiki concept, "a wiki is a freely expandable collection of interlinked Web pages, a hypertext system for storing and modifying information- a database where each page is easily edited by any user with a form-capable Web browser client" (Schwartz et al., 2004). Users can visit wiki, read and add content to wiki or update and organize content (text, image, video, link…) or structure of wiki (Augar et al., 2004). As wikis are free open source software, no one authorizes the creation of wiki pages and everyone is automatically authorized to write, edit and publish (Fountain, 2005).

As blogs, wikis are also attracted attention in educational field for their advantages and usability, and studies about using wikis in education have increased. Wikis are considered to be effective tools for learning and teaching as they facilitate collaborative learning, provide collaborative writing, support project based learning, promote creativity, encourage critical searching, support inquiry based and social constructivist learning (Cress&Kimmerle, 2008; Guzdial et al., 2001 and Yukawa, 2006). Schwartz et al. (2004) has listed selection criteria of wikis for educational uses under 6 heading; cost, complexity, control, clarity, common technical framework, features. Some of other educational usage of wikis are also suggested as classroom websites, easy course administration and timetabling, easy online updating content, online dictionary, student feedback and self assessment, bibliographically organized class or group projects, virtual classes for online collaboration, creating frequently asked questions (FAQ) for classroom or students (Konieczny, 2007; Lamb, 2004; Zeinstejer, 2008).

Podcast: The term of podcast is constituted of words of iPod (portable digital audio player form apple) and broadcasting and they are basically digital audio programs that can be subscribed to and downloaded by users via RSS and listened to on either a variety of digital audio services or desktop computer (Petter et al., 2005). With on-demand nature and portability features, podcast allows users to catch up on audio content while completing other tasks without having to sit at a computer. They also have some limitations as being linear and one way, which is why they need to be integrated with blogs, online simulations and other more interactive channels (Kaplan-Leiserson, 2005).

Especially as podcasting is being used with mobile devices, it can be viewed as another variant of mobile learning. Because of the time and cost resources are limitations for mobile learning, podcasting can be an alternative (Kaplan-Leiserson, 2005). Although podcasting is not a synchronous activity, it provides students information that will help them feel connected to learning community and this may be even pedagogically appropriate in some courses to allow students to create their own podcasts for the rest of the class members (Beldarrin, 2006).

Social Networks: Social networks are software that support collaboration, knowledge sharing, interaction and communication of users from different places who come together with a common interest, need or goal (Pettenati & Ranier, 2006; Brandtzæg & Heim, 2007). Social networks are also known as range of applications that augments group interactions and shared spaces for collaboration, social connections, and aggregates information exchanges in a web-based environment (Bartlett-Bragg, 2006).

Social networks can also be viewed as pedagogical tools that stem from their affordances of information discovery and sharing, attracting and supporting networks of people and facilitating connections between them, engaging users in informal learning and creative, expressive forms of behavior and identity seeking, while developing a range of digital illiteracies (Lee& McLoughlin, 2008).

Models and Theories about Adoption of Web 2.0 Tools in Distance Education

As it is expected that potential advantages of Web 2.0 technologies for distance education should facilitate the adoption process of these tools; diffusion, adoption and acceptance of innovations are dynamic and multi-faceted.

Ajjan and Hartshorne (2008) argued that Web 2.0 tools are a new trend of internet technologies which have many characteristics that support teaching and learning and there have been many studies about technology usage in education though, majority of them are limited to delivery of content and teaching course subject. Although they underlined that it is important to explore student and faculty awareness and use of Web 2.0 technologies, there have been limited studies about it.

While investigating diffusion of Web 2.0 technologies in distance education, many different dimensions such as student, teacher, media, technology access, cost, efficacy of users, resources, social dimension etc., must be taken into consideration. Therefore, examining adoption of Web 2.0 in distance education with only one diffusion, adoption or acceptance theory and model can be inadequate.

There have been different models and theories about diffusion, acceptance and adoption of an innovation. While some of them are grounded in social physiological context and focused on internal decision processes at individual level (Ajzen, 1991; Davis, 1989; Fishbein&Ajzen, 1975), others focused on features of innovation and focused on diffusion of new among users in a system (Moore&Benbasat, 1991; Rogers, 2003). When studying in Web 2.0 technologies and distance education context, it is necessary to consider individual decision processes and features of innovation both. So it can be suggested that investigating Web 2.0 adoption in distance education within a holistic view in the framework of Diffusion of Innovation Theory (Rogers, 2003), Theory of Reasoned Action (Fishbein&Ajzen, 1975), Theory of Planned Behavior (Ajzen, 1991), Technology Acceptance Model I and II (Davis, 1989; Venkatesh and Davis,

2000) and Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003) would bring out more in depth and comprehensive approach.

Diffusion of Innovation Theory: This theory analyzes the how an innovation diffuses in a social system. Rogers (2003) defined diffusion as "in which an innovation is communicated through certain channels over time among members of a social system". This theory is based on four main components that are innovation, communication channel, time and social system. Rogers explained that time is involved in diffusion at three point; 1) innovation decision process (knowledge, persuasion, decision, implementation and confirmation), 2) innovativeness of an individual (innovators, early adopters, early majority, late majority and laggards) and 3) an innovator's rate of adoption in a system. He also suggested that five characteristics of an innovation, namely relative advantage, compatibility, complexity, trialability and observability, influence rate of adoption of an innovation. Moore and Benbasat(1991) expanded the number of innovation characteristic to seven; three of them are directly adopted from Rogers (relative advantage, compatibility and trialability) and further four included ease of use, image, visibility and result demonstrability.

Technology Acceptance Model I and II: Technology Acceptance Model (TAM) basically adopted from Theory of Reasoned Action by Davis (1989) to predict acceptance and future usage of innovation. "Ease of use" and "usefulness" are determined as major factors which influence acceptance or rejection of an innovation by individuals in TAM. Davis suggested that if individuals believe that using an innovation could be effortless, this will lead to perception of ease of use and also if individuals believe that innovation helps them to increase their performance, and this will lead to perception of usefulness. According to TAM people it is more likely to use an innovation as they perceive easy and useful.

Venkatesh and Davis (2000) proposed Technology Acceptance Model II (TAM II) with the aim of extending TAM to provide a detailed account of the key forces underlying judgments of perceived by including additional key determinants of perceived usefulness and usage intention constructs. External variables that effect perceived usefulness are divided into two groups as social influence processes and cognitive instrumental processes in TAM II. Constructs that spanning social influence processes are determined as subjective norm, voluntariness, and image and constructs that spanning cognitive instrumental processes are determined as job relevance, output quality, result demonstrability and perceived ease of use(Venkatesh ve Davis, 2000).

Theories of Reasoned Action and Planned Behavior: Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) are grounded in social physiological context. TRA proposes that behavior of adopting an innovation is influenced directly by intention and intention is determined by attitude and subjective norms (Ajzen&Fishben, 1975). TPB is basically adopted from TRA by inclusion of a third determinant of intention as perceives behavioral control (Ajzen, 1991). The main reason for the inclusion of this construct is to underline that individuals do not have volitional control for their all behaviors and sometimes behaviors can be performed involuntary.

Unified Theory of Acceptance and Usage Theory (UTAUT): To integrate the fragmented theory and research on individual acceptance of information technology, Venkatesh et al. (2003) set out a unified theoretical model that captures the essential elements of eight previously established models. While setting UTAUT 8 models namely, Diffusion of Innovation, Theory of Reasoned Action, Theory of Planned Action, Technology Acceptance Model, Combined TAM and TPB, Motivational Model, Social Cognitive Theory, Model of PC Utilization, after reviewing all constructs in the models, 7 constructs (effort expectancy, performance expectancy, social influence, facilitating conditions, attitude, self efficacy and anxiety) were found significant direct determinants of intention or usage in one or more of the individual models, but when theorizing UTAUT only four of these constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) taken into model. However the other 3 constructs, attitude, self efficacy and anxiety, were not found significantly influential. Beside the direct constructs, age, gender, experience and voluntariness of use were determined as significant moderators considered to be influential on main constructs. Finally, as result of the experimental studies, UTAUT was found for being able to be accounted for 70 percent of the variance in usage intention—a substantial improvement over any of the original eight models and their extensions (Venkatesh et. al, 2003).

Conclusion

Because of continuous globalization of information, learning independent from time and place, cost, need for life long learning, effectiveness etc., distance education and other forms of education (web based learning, e-learning, online learning etc.) are being considered for utilization in different fields and levels of education. Providing interaction between students, teacher, content etc. has been a major factor since beginning of distance education and developments in technology that provides interaction, has brought out necessity of continuous

support for process. As Web 2.0 technologies support interaction process, many advantages of them have also been a response for questions about adoption of these technologies in distance education. On the other hand, one of the most important ways of obtaining effective outcomes with these technologies, is individuals' acceptance and usage of technology in system and there has been many studies in the framework of different models and theories in this field(vaan Raaij and Schepers, 2008). While some of these studies were conducted quantitatively, others were performed qualitatively (Aşkar & Usluel, 2002; To et al., 2008). It can be suggested that different dimensions of adoption process would be explained by the problem of the research together with the effects of method used. Of course, it is well known that all dimensions of a question cannot be handled with only one single research. But the need for more comprehensive and in depth studies about adoption of innovations is also clear Therefore, it can be suggested that utilization from various and different theories and research methods will strengthen the studies in this field. While investigating adoption of these tools in distance education, researches for a holistic view by utilizing various theories and models like Venkatesh et al. (2003) may be needed. Further researches could establish a new model by selecting appropriate constructs from previous models and theories and could examine the adoption of Web 2.0 tools in distance education, by considering both technological characteristics of technology and factors in distance education as students, teacher etc. Additionally, except from previous constructs, external new constructs can be included into this model.

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