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Pre-service teachers' perceptions about web 2.0 technologies

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Abstract

The aim of the study was to examine the pre-service teachers' perceptions about Web 2.0 technologies in their learning process and to understand their acceptance levels and attitudes towards these tools. The data gathered from a sample of 101 first year pre-service science and computer teachers in the 2009 Fall semester. The survey was made up of three components: demographic data, Web 2.0 attitude scale, and Unified Theory of Acceptance and Use of Technology (UTAUT) scale. The results indicated that participants' perceptions about Web 2.0 technologies were positive and also acceptance and willingness to use these technologies was high. The learners mostly preferred to use audio/video conferencing technologies rather than the other technologies since they are more familiar with it.

1. Introduction

In the past decade, Web has become one of the widely used means for providing learning materials for students to share and gatter information. More recently, a major change has occurred in the way Web technology is being used in educational settings. Researchers believe that it has potential to further improve learning and interaction among learners and teachers (Hartshorne & Ajjan, 2009). New social-sharing applications are transforming the Web technology from Web 1.0 (read-only) environment to Web 2.0 (read/write) technologies. Students today are considered "digital natives" (Prensky, 2001a), "Net generation" (Oblinger & Oblinger, 2005; Tapscott, 1998) and "Generation M(edia)/(ultitasker)" (Rideout, Foehr, & Roberts, 2005). Because they have grown up with digital technology—first computers, then the Internet and other ubiquitous information and communication devices such as cell phones, PDAs, iPods, and Web 2.0 technologies—digital natives are considered to be more comfortable with digital technology than previous generations. Educators have pointed out that digital natives use technology differently and learn differently from their parents and teachers (Beck & Wade, 2004; DeDe, 2005; McHale, 2005; Oblinger & Oblinger, 2005; Prensky, 2001b).

Web 2.0 technologies — wikis, blogs, social networking, and so on — all encourage a more active, participatory role for users. Students no longer use the web to obtain information, but instead create information and share it with others using Web 2.0 technologies (Maloney, E. (2007).

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The phrase Web 2.0 was first used in 2004, to refer to what is perceived as a second generation of Web-based services emphasizing online collaboration and sharing. Howe (2006) categorizes four general types of processes within Web 2.0 applications that reflect these ways of interacting:

- for sharing user-contributed content ("You make it")
- for large sets of user contributed content ("You name it")
- for the development of content collections by the user community ("You work on it"), and
- for finding not only objects but trends and overviews of contributions ("You find it").

To Howe's list can be added virtual world environments, in which users create the worlds and artifacts within the worlds that they are simulating and then interact within the virtual worlds with their newly created artifacts.

Blog (Blogger, WordPress): It is a website where entries about topics are written in chronological order and commonly displayed in reverse chronological order. Other users could comment on those entries.

Wiki (Seedwiki, Wikipedia): It is computer software that allows users to easily create, edit and link web pages. Wikis are often used to create collaborative websites, power community websites, and are increasingly being installed by businesses to provide affordable and effective Knowledge Management.

Social Networking (Facebook, MySpace) : It focuses on the building and verifying of online social networks for communities of people who share interests and activities, or who are interested in exploring the interests and activities of others.

Social Bookmarking (Digg, de.licio.us) : It is a way for Internet users to store, organize, share and search bookmarks of web pages. In a social bookmarking system, users save links to web pages that they want to remember and/or share.

Instant messaging (MSN Messenger) : It is a form of real-time communication between two or more people based on typed text. The text is conveyed via computers connected over a network such as the Internet.

Internet Telephony (Skype): is a form of real-time communication of audio between two or more people. It enables people to use the Internet as the transmission medium for telephone calls.

Audio/Video Conferencing (NetMeeting): It is a form of real-time communication of audio and video between two or more people at different sites. Besides the audio and visual.

This study aimed at examining the pre-service teachers' perceptions about Web 2.0 technologies, understanding their acceptance levels and attitudes towards these technologies. The following research questions were investigated:

1. What are the pre-service teachers' attitudes towards Web 2.0 technologies?
2. What are the Web 2.0 technologies acceptance levels of pre-service teachers?

2. Method

The study was conducted with 43 pre-service science and 58 pre-service computer teachers in the 2010 Fall semester in Turkey. The survey was made up of three components: demographic data, Web 2.0 attitude scale,and Unified Theory of Acceptance and Use of Technology (UTAUT) scale. The data were analyzed with descriptive statistics using the SPSS 16.00 program.

2.1. Participants

The participants were selected using purposive sampling on the basis of convenience. Out of 120 possible participants, 101 responded the survey. The distribution of the participants was 42.6% (43) science and 57.4% (58) computer pre-service teachers. The participants were aged between 17 and 23 with a mean of 18.97. The overall gender of the participants was 39% (39) male and 61% (61) female. The percentages of having computer and internet facilities and e-mail account of the participants as follows: 49% had personal computers; 51% had access to Internet either personal or public computers; and 95% had an e-mail account. In addition, the levels of computer use of participants were 1% never used, 3% novice; 46% competent; 50% proficient, and the level of internet use of participants were 1% never used, 2% novice, 39% competent; and 58% proficient,.

2.2. Instruments

The data was gathered through the following means: The survey was made up of three components: demographic data, UTAUT Scale, and a survey instrument designed using the Decomposed Theory of Planned Behavior (DTPB).

2.2.1. Demographic data

The demographic data included eleven items asking the participant gender, age, year in school, having computer at home, having Internet connection at home, having an email address, frequency of checking email, frequency of using the computer laboratory at school, level of computer use, level of Internet use, and preference of using Web 2.0 technologies in class.

2.2.2. Web 2.0 Attitude Scale

A 29 item survey instrument was designed using the DTPB. The survey consisted of 6 sections. Survey items were adapted from previous studies (Hartshorne and Ajjan, 2009) and focused on items exploring comfort level (''Please list your comfort level [Never Use, Novice, Competent, Proficient] with the following Web 2.0 technologies (blogs, wikis, social networks, social bookmarking, audio/video conferencing, video sharing), actual usage of specific Web 2.0 technologies in the classroom (''I know enough to use Web 2.0 technologies''), and attitudes toward Web 2.0 technologies (What are, in your opinion, the advantages of using each of the following Web 2.0 technologies–blogs, wikis, social networking, social bookmarking, audio/video conferencing, video sharing —to (1) Improve students' interaction with faculty, (2) Improve students' learning, (3) Improve students' satisfaction with the course, (4) Improve students' interaction with other students, (5) It could be easily integrated into my course, (6) Improve student's writing ability). Additionally, the instrument consisted of a series of items using a five point Likert-type scale (strongly disagree to strongly agree) to examine factors that influence student intentions to utilize Web 2.0 technologies in their courses. Items focused on areas of actual usage, behavioral intention, attitude, ease of use, perceived usefulness, subjective norms, perceived behavioral control, peer influence, superior influence, compatibility, facilitating conditions (technology and resources), and self efficacy.

An alpha reliability coefficient of the original scale was found to be 0.80 to 0.97 by the authors. The scale was translated into Turkish with the permission of authors of the original scale. Cronbach's alpha reliability coefficient of Turkish version of the scale was found to be 0.92, indicating a high reliability.

2.2.3. Unified theory of acceptance and use of technology (UTAUT) scale

The modified 24-item UTAUT scale (Wang, Wu, & Wang, 2009) adopted from Venkatesh et al. (2003) was employed in this study. The survey included items about performance expectancy (4-item), effort expectancy (4-item), social influence (4-item), perceived playfulness (5-item), self-management of learning (4-item), and behavioral intention to use the system (3-item). The survey was modified and translated into Turkish with the permission of the authors. The Cronbach alpha coefficient of the modified scale was measured as 0.85 while it was 0.90 in the original scale.

3. Results

Results are organized according to research questions:

3.1. Pre-service teachers' attitudes towards Web 2.0 technologies in their courses

Descriptive statistics involving means and standard deviations were used to determine the attitudes towards adopting Web 2.0 technologies. In this scale possible overall scores could range from 29 to 145. The results (x=97.33, sd=22.98) indicated that the pre-service science teachers have positive attitudes towards using Web 2.0 technologies in learning process.

Majority of the participants (62%) stated that they would use Web 2.0 technologşes in their courses while 35% of them might use, and only 2% of them did not think to use Web 2.0 technologies.

3.2. Pre-service teachers acceptance levels of using Web 2.0 technologies

Mean score and standard deviation results of the UTUAT survey (x=87.87, sd=13.49) revealed that participants' Web 2.0 technologies acceptance levels were found to be at high level when considering that possible overall scores could range from 24 to 120.

3.2.1. Pre-service teachers comfort level with the Web 2.0 technologies

The results revealed that the highest score at the proficient level of using Web 2.0 technologies was instant messaging (27.4%), Internet telephony (22.3%), and social networking(20.8%), while social bookmarking (66.7%) blogs (58.7%), and wikis (32.6%) were the least used technologies. Their comfort level with the following Web 2.0 technologies can be seen in Table 1.

Table 1. Pre-service teachers' comfort level of using Web 2.0 technologies

Web 2.0 technology	Never Use		Rare		Novice		Competent		Proficient	
	f	%	f	%	f	%	f	%	f	%
Blogs(Blogger, WordPress)	54	58.7	16	17.4	17	18.5	5	5.4	0	0
Wikis(Seedwiki, Wikipedia)	31	32.6	22	23.2	15	15.8	23	24.2	4	4.2
Social Networks(Facebook, MySpace)	13	13.5	6	6.3	25	26.0	32	33.3	20	20.8
Social Bookmarks(Digg, de.licio.us)	58	66.7	15	17.2	11	12.6	3	3.4	0	0
Instant messaging(MSN Messenger, Yahoo Messenger)	2	2.1	7	7.4	23	24.2	37	36.6	26	27.4
Internet Telephony(Skype)	6	6.4	13	13.8	26	27.7	28	29.8	21	22.3
Video Sharing Sites (Youtube)	12	12.6	14	14.7	24	25.3	28	29.5	17	17.9

3.2.2. Pre-service teachers' extent level of using Web 2.0 technologies for supplementing class learning

The results suggested that 1.2% (n=1) of the pre-service teachers preferred to use social bookmarks, 4.8% (n=4) video sharing, 6.0% (n=5) Internet telephony. In addition, 6.0% (n=5) of them preferred to use blogs, 20.5% (n=17) instant messaging, 28.9% (n=24) wikis, and most of them (32.5%; n=27) preferred to use social Networks such as facebook in order to supplement their class learning.

Their extent to use of the following Web 2.0 technologies to supplement their in-class learning can be seen in Table 2.

Table 2. Pre-service teachers' extent level of using Web 2.0 technologies for supplementing class learning

Web 2.0 technology	Do not use and do not plan to use		Do not use but plan to use		Use occasionally		Frequently use		Always use	
	f	%	f	%	f	%	f	%	f	%
Blogs(Blogger, WordPress)	19	21.8	51	58.6	14	16.1	2	2.3	1	1.1
Wikis(Seedwiki, Wikipedia)	13	14.0	33	35.5	24	25.8	17	18.3	6	6.5
Social Networks(Facebook, MySpace)	17	17.9	20	21.1	32	33.7	22	23.2	4	4.2
Social Bookmarks(Digg, de.licio.us)	21	24.4	46	53.5	13	15.1	5	5.8	1	1.2
Instant messaging(MSN Messenger, Yahoo Messenger)	8	8.6	13	14	37	39.8	28	30.1	7	7.5
Internet Telephony(Skype)	15	16.1	17	18.3	35	37.6	18	19.4	8	8.6
Video Sharing Sites (Youtube)	15	16.1	20	21.5	37	39.8	16	17.2	5	5.4

4. Conclucions

The focus of this study was to determine pre-service teachers' perceptions about Web 2.0 technologies. Findings of the study showed that pre-service teachers generally have adequate technical resources, and that they often use computers and general Internet-based resources.

Their comfort level on using Web 2.0 technologies was high especially with certain technologies, such as, social networking, instant messaging, Internet telephony, and video sharing sites. Similarly pre-service teachers stated that they would use the same Web 2.0 technologies to supplement their in-class learning. While their actual use of blogs, wikis, and social bookmarking is limited, most teachers recognize value in employing Web 2.0 technologies in instruction. Our results support the findings of previous research on this topic (Hartshorne & Ajjan, 2009, Maloney, 2007; Howe, 2006).

In summary, pre-service teachers both had positive attitudes and a high acceptance level of using Web 2.0 technologies regarding support their courses. This indicates that most of the pre-service teachers would be willing to

use Web 2.0 technologies. Therefore, it can be concluded that the Web 2.0 technologies can be used for supporting the courses in teacher programs as it has potential to improve learning and ensure interaction among learners and teachers.

Web 2.0 technologies are powerful enabling means in instruction and they are potentially useful emerging technologies in higher education. The current study indicates a willingness on the part of pre-service teachers to make use of Web 2.0. The study provides guidance regarding conditions that would need to be in place for designing instruction for digital natives.

References

Beck, J. C., & Wade, M. (2004). Got game: How *the gamer generation is reshaping business forever*. Boston, MA: Harvard Business School Press.

Dede, C. (2005). Planning for neomillennial learning styles: Implications for investments in faculty and technology. In D.Oblinger & J. Oblinger (Eds.), *Educating the Net Generation* (pp.15.1–15.22). Boulder, CO: EDUCAUSE.

Hartshorne R. & Ajjan H. (2009) Examining student decisions to adopt Web 2.0 technologies: theory and empirical tests. *Journal of Computing in Higher Education* 21(3), 183-198.

Howe, J. (2006). Your Web, your way. *Time Magazine*, 168(26), 60-63.

Maloney, E. (2007). What Web 2.0 can teach us about learning? *Chronicle of Higher Education*, 25(18), B26.

McHale, T. (2005). Portrait of a digital native. *Technology & Learning, 26*(2), 33–34.

Oblinger, D., & Oblinger, J. (2005). Is it age or IT: First steps towards understanding the net generation. In D. Oblinger & J. Oblinger (Eds.), *Educating the Net Generation* (pp. 2.1–2.20). Boulder, CO: EDUCAUSE.

Prensky, M. (2001a, September/October). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–6.

Prensky, M. (2001b, November/December). Digital natives, digital immigrants, part 2: Do they really think differently? *On the Horizon*, 9(6), 1–6.

Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2005). *Generation M: Media in the lives of 8–18-year-olds*. Washington, DC: A. Kaiser Family Foundation Report.

Tapscott, D. (1998). *Growing up digital: The rise of the net generation.*New York: McGraw Hill.