

Comparison of Web 2.0 Technology Acceptance Level based on Cultural Differences

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ABSTRACT

In order to inform educators in higher education on the integration of Web 2.0 applications for engaging and effective learning experiences, this survey study compared the use and acceptance of Web 2.0 applications between American and Korean college students through the lens of cultural differences. Undergraduate students were recruited to participate in this study in the U. S. and the South of Korea, producing 183 usable responses. Targeting six Web 2.0 applications (blogs, instant messenger, online social communities/Facebook, online video sharing/YouTube, online video & audio conference/Skype, and social virtual communities/Second Life) the survey investigated five categories of technology acceptance based on the Unified Theory of Acceptance and Use of Technology. Significant differences on utilization level and the anxiety level for using them were found in numerous Web 2.0 applications. Korean students responded that most Web 2.0 applications are apprehensive for them to use when compared to their counterparts in the U.S.. The study further discussed the observed differences based on cultural theories and their implications on Web 2.0 learning technology integration.

Keywords

Web 2.0, cultural difference, technology preferences

Introduction

Today, college students use Web 2.0 applications more frequently than ever in and out of the classrooms. Applications such as blogs, instant messenger, online communities, video sharing tool, and web conferencing tool are gaining popularity. Students use them to create their own contents on the web, contribute and collaborate with others, and develop social networks via multiple formats of media and representation (O'Reilly, 2005). These activities although imply the possibility of using Web 2.0 applications for instructional purposes in higher education (Weller, Pegler, & Mason, 2005), it also raises the question of whether or not students can efficiently utilize the same Web 2.0 tools for learning (Huang & Behara, 2007). Even though students already use a variety of Web 2.0 applications on a daily basis, they may not know how to use them efficiently for gaining new knowledge or developing new skills. Educators in higher education interested in using Web 2.0 applications also need empirical evidences to help them integrate Web 2.0 applications in their instructional environments. This study aimed to explore these issues as an effort to promote the utilization of Web 2.0 applications to enhance learning experiences. Specifically, we were interested in exploring cultural differences' effect on Web 2.0 application utilization since research has suggested that such differences are present in the virtual world as well as in the physical world (Pfeil, Zaphiris, & Ang, 2006). Through comparison between participants from the U.S. and South Korea we aimed to investigate the usage of, and the technology acceptance level of Web 2.0 applications among college students. This study intended to answer the following questions:

- Do students from different countries prefer different Web 2.0 applications for learning?
- Are there different attitudes towards using Web 2.0 applications based on their cultural contexts?

Web 2.0 Applications for Learning

According to Anderson (2007), Web 2.0 is a collective term for a group of web-based technologies that broaden users' communication capabilities and options. Available tools include blogs, wikis, RSS feeds, online video sharing (e.g., YouTube, Google Video), and online social networking sites (eg., Facebook, LinkedIn, Ning). Timothy O'Reilly (2005), who initially conceived the term, defines Web 2.0 as an active and open web architecture that values users' proactive participation and contribution, which makes it more personalized and interactive than the previous generation Web applications (McLoughlin & Lee, 2007). Due to Web 2.0 applications' features in promoting proactive participation and collaborative sharing, they are suggested to bear great potential in educational settings.

In formal learning, Safran, Helic, & Gutl (2007) emphasized that Web 2.0 applications make it possible to uphold critical and analytical thinking, facilitate intuitive and associational thinking, and support analogical thinking through ease access to rich information and interacting various opinions. Such applications might be efficient in conducting case studies due to their collaborative nature based on experiential learning approach (Huang & Behara, 2007). Furthermore, Web 2.0 applications enable users to connect to and collaborate with others with diverse interactions (Selwyn, 2007). For educators who implement student-centered learning activities and students who want to gain knowledge or skills through student-centered learning, Web 2.0 applications could also provide versatile opportunities. Boyd (2007) claimed that social aspects of Web 2.0 might support three activities that characterize student-centered learning. First is the support for conversational interaction. Second is the support for social feedback. Third is the support for social networks and relationship between people for enhancing the learning experience. *Facebook* (<http://www.thefacebook.com>), for example, is a social network community (SNC) that could enrich the learning process by allowing users to express themselves freely (Selwyn, 2007). Since *Facebook* has many useful facets for education such as reflective elements, peer-feedback with social context of learning (Selwyn, 2007), some educators have utilized its capacity for connecting students easily and optimistically (Lemeul, 2006). *Second Life*, an online virtual community, has also been used for educational purposes because it supports learning activities such as uploading personal opinions, participating in team work, and sharing knowledge and information made by users (Selwyn, 2007). Johnson & Levine (2008 & 2009) reported that in the next three to five years, higher education institutions will adopt a wide variety of Web 2.0 applications for the purposes of better engaging college students and enhancing instructional efficiencies. In terms of informal learning, Klamma, Chatti, Duval, Hummel, Hvannberg, Kravcik, Law, E., Naeve, & Scott, (2007) suggested that Web 2.0 applications could facilitate and enhance lifelong learning experience by connecting students in collaborative environments with diminishing boundaries around the world. People are engaged in a wide range of technologies-based informal learning at home and in the communities by continuously collaborating with others in interaction-rich social environments (Selwyn, 2007).

In sum, Web 2.0 applications, as discussed earlier, might be prominent to enable educators to create personalized, active, participatory, and cooperative learning environments (McLoughlin & Lee, 2007). In turn, educators can provide extensive opportunities for students who have various needs to enhance their learning experiences through enriched interactions and collaborations in Web 2.0 applications (Bryant, 2006; McLoughlin & Lee, 2007).

Web 2.0 Applications and Cultural Differences

The increasing use of the Internet in educational settings around the world has prompted discussions about the relationship between cultures and technologies (Holmes, 1998). Collis (1999) argued that culture is a critical factor in influencing how people accept, react to, and use the Internet. Recent studies have explored the cultural diversity of usage of the Internet. Li and Kirkup (2005) investigated cultural differences of the Internet use between students of universities in China and in the UK. Their results showed that British students used computers more for their study than Chinese students. Chinese students, however, had more confidence about their advanced computer skills. Allwood and Wang (1990) studied how students conceptualize computers in China and Sweden. They revealed that Swedish students were more pessimistic about the effects of computers on society than their Chinese counterparts. Other research (Brosnan & Lee, 1998; Collis & Willians, 1987) further concluded the effect of cultural differences on computer users' attitudes might be observable. Omar (1992) studied how college students have different attitudes towards computers and found that American students have more positive attitudes than Kuwaiti students.

According to Hofstede (1980, 1991), national differences can be understood in terms of national cultures. Cultures, in Hofstede's assertion, consist of four dimensions: power distance, individualism/collectivism, masculinity/femininity, and uncertainty avoidance. Power distance refers to "the degree of inequality in power between a less powerful individual and a more powerful other, in which individual and other belong to the same social system" (Hofstede, 2001, p. 83). High power distance of organizations tends to realize and accept that power is not given to employees equally (Hofstede, 1994, 1998). Individualism refers to the degree to which individuals feel they are "on their own" rather than part of a larger group identity. Masculinity refers to the degree to which a culture emphasizes competition, achievement, and "getting ahead" (Bearden, Money, & Nevins, 2006, p. 195). Uncertainty avoidance indicates the degree of tolerance for ambiguity and risk.

Among the four dimensions of cultural difference, power distance, individualism vs. collectivism, and uncertainty avoidance are particularly relevant in studying the use of Web 2.0 applications. Mandl (2009) explored comparing Chinese and German Blogs. They figured several results that Chinese expressed emotional and positive comments on Blogs compared to Germany. Users in Germany posted more negative comments on their blogs. This result assumes that users in China, whose culture is characterized by collectivism, tend to express less negative comments as they try not to say negative comments about others. A recent study explored the relations between the patterns of changes on wikis and the cultural background of the contributors, and suggested the tools themselves are neutral but cultural differences might affect how users utilize them (Pfeil, Zaphiris, & Ang, 2006). Their study found that respondents from high distance power countries tended to be reluctant to delete others' contents or links, even though they thought the content was incorrect. Respondents from high masculinity countries tended to add information and contribute to group products through lots of activities.

The most valuable advantage of Wiki is supporting collaboration among team members. According to Cogburn & Levinson (2003), one of the factors that hindered effective collaboration in virtual projects was the different communication styles from cultural differences. Gudykunst and Ting-Toomey (1988) reported the relationship between collectivism/individualism by Hofstede (1986) and high context/low context (Hall, 1976). In high context cultures, a lot of 'unspoken' meaning follows when users communicate with others. Hofstede (1984, 1986) addressed that North American and Western European countries tend to have individualism and low context culture. In contrast, South American and many Asian countries tend to be collectivistic and high context culture. Therefore, users in low culture cultures may not figure 'unspoken' meaning out in virtual communication. Guo, Tan, Turner, and Xu (2008) investigated preferences of communication media (face to face, telephone, email and instant messenger) from Australia and China. Chinese preferred to use telephone and instant messenger, while Australians preferred to use email. According to Hofstede (1989), China had an uncertainty index score that was lower than Australia. In order to avoid uncertainty, Australia may prefer to use email instead of telephone or instant messenger.

Flickr, a popular social photo-sharing tool, was investigated by Dotan and Zaphiris (2010). They revealed the cultural differences in websites driven by different countries' users such as Peru, Israel, Iran, Taiwan and the U. K. The users from Peru and Taiwan were less interested in sharing content compared to users from Iran and Israel since Peru and Taiwan had the highest power distance index and lowest individual index scores. However, the correlation between Hofstede's scores and quantitative data based on users' activities on websites with Flickr was weak. The gathered quantitative data may not reflect cultural differences or the index of cultural dimensions might be needed to collect.

Chapman and Lahav (2008) investigated social network sites from different cultures such as U.S, France, China, and South Korea. The results showed the differences in terms of the users' goals, typical pattern of self-expression, and common interaction behaviors. Users of popular social network sites in the U.S tend to publish more personal information. In contrast, users in China publish less personal information than those in the U.S.. In terms of self-expression, French users tend to discuss common topics instead of personal topics but Chinese users tend to discuss more personal topics. On interaction behaviors of social network sites, there are differences of user's behaviors between the U.S and South Korea. Shin (2010) investigated motivations for utilizing social networking sites from the U.S and South Korea. The results revealed that users from both countries believe social networking sites are useful and entertaining. Users in the U.S. utilize social networking sites because of extrinsic motivation but users in South Korea utilize them due to intrinsic motivation. In addition, users in South Korea connect with their real friends who they know and share content on Cy-world (Shin & Kim, 2008). However, users in the U.S. did not consider friends on MySpace as real friends (Dwyer, 2007). MySpace allows users in the U.S. to connect members who have the same interests or opinions and the social relations may be different between Cy-world and MySpace because of this reason (Shin, 2010). Fogg and Iizawa (2008) compared two popular social networking sites from the U.S and Japan to investigate how social networking tools might motivate users in different cultures. Facebook has direct and assertive motivators and Mixi, a popular social network site in Japan has indirect and subtle motivators.

Park, Mohan, and Ponnusamy (2009) investigated the learners' perception of Web 2.0 applications for learning. The results showed that Malaysian students learned more from a collectivist learning approach but the American students preferred an individualistic learning approach. However, learners in two countries responded that Web 2.0 applications were useful for learning. Eze (2009) conducted an online survey to explore which factors influence the utilization of Web 2.0 applications of European undergraduate and graduate students for learning. A total of 285 participants participated in the online survey from the Netherlands, Great Britain, and Ireland. This study reported

that culture is essential when users utilize Web 2.0 applications for learning. In particular, individualism, power distance, masculinity, and technology experience affected the utilization of Web 2.0 applications. Singh, Zhao and Hu (2003) compared Chinese and American websites focusing on cultural differences and stated, “the web is not a culturally neutral medium, but it is full of cultural markers that give country-specific websites a look and feel unique to the local culture”(p.63). That is, although the Internet is used around the globe, students use it differently based on their situational or national contexts (Li & Kirkup, 2007).

In sum, the usage of, and the technology acceptance level of Web 2.0 applications might be influenced by users’ cultural differences since previous research has suggested that such differences are present in the virtual world. Therefore, this study focuses on examining cultural differences’ effect on Web 2.0 application utilization through comparison between participants from the U.S. and South Korea.

Method

Participants

This survey study was conducted in 2008 at a public midwestern university in the U.S. and at two private universities in South Korea. A total of 314 *students (107 American students and 207 Korean students)* were recruited to participate, producing 183 usable responses (*83 American and 100 Korean*). Comparison analyses were conducted to identify the difference between the two sets of survey data. All data were collected via voluntary participation by a web-based survey interface.

Measuring Utilization Level of Web 2.0 Applications

To cover a wide range of technologies that have been utilized in e-learning settings in higher education, this study targeted six Web 2.0 applications: blogs, instant messenger, online social communities (eg., Facebook), online video sharing (eg., YouTube), online video & audio conferencing tools, and social virtual environment (eg., Second Life). To investigate the utilization level of Web 2.0 applications, the research team created the survey based on selected categories of *Unified Theory of Acceptance and Use of Technology (UTAUT)* (Venkatesh, Morris, Davis, & Davis, 2003), which includes performance expectancy, effort expectancy, attitude, social influence, and anxiety. See Table 1 for survey items on Web 2.0 utilization. UTAUT is the synthesis of eight other models (ie., theory of reasoned action, technology acceptance model, motivational model, theory of planned behavior, model of PC utilization, innovation diffusion model, and the social cognitive theory). The instrument measures a unified technology acceptance rate expressed by individuals or organizations.

Table 1. Acceptance of Web 2.0 applications

Category	Questions	Code
Performance expectancy	1. I would find it useful in my learning tasks	1
	2. Using it enables me to accomplish tasks more quickly	2
	3. Using it increases my productivity	3
Effort expectancy	4. Learning to use it is easy for me	4
	5. Using it for learning is a good idea	5
Attitude toward using Web 2.0 applications	6. It makes learning more interesting	6
	7. I like learning with it	7
Social influence	8. People who influence my behavior think that I should use it	8
Anxiety	9. I feel apprehensive about using it	9
	10. It is somewhat intimidating to me	10

Procedures of the Study

The survey was developed using an online survey tool, Survey Monkey (<http://www.survey.monkey.com>), which can be accessed from anywhere via the Internet. Participants had as much time as they needed to complete the

survey. But they can access the online survey once. Questions were based on a 7-point Likert scale with response options ranging from *strongly disagree* (1) to *strongly agree* (7). Demographic information regarding students was also obtained. Participants were recruited from undergraduate and graduate programs via random selections. The researchers then contacted course instructors for permissions to post the research information in their classrooms explaining the purpose and procedure of the study. The online survey was available for four months before the data analysis.

Results

Based on the research questions, this study used both descriptive and inferential statistics for data analysis. The research team first used descriptive statistics to report the distribution of Web 2.0 utilization levels. Inferential statistics (ie., *t*-test) was then conducted to identify the difference on participants' Web 2.0 utilization levels between samples from the two countries.

In total, 107 students from a public mid-western university in the U.S. and 207 students from two private universities in South Korea participated in the study. However, 131 participants' datasets were removed due to incompleteness or errors. The research team analyzed 183 usable responses for the utilization of Web 2.0 applications (59% of 314 submitted responses). Of the 183 completed surveys, 75 of them were male (40.9%) and 77 were female (42.0%). The data consists of 18 (9.8%) freshmen, 45 (24.5%) sophomores, 50 (27.3%) juniors, 51 (27.8%) seniors, and 14 (7.6%) graduates. The respondents also reported their academic majors. See Table 2 for the demographic and academic major data.

Table 2. Descriptive statistics of the respondents (%)

Demographics	U.S (n=83)	South Korea (n=100)	Total (n=183)
Sex			
Male	42(50.6%)	33(33%)	75(40.9%)
Female	21(25.3%)	56(56%)	77(42.0%)
No response	20(24.0%)	11(11%)	31(16.9%)
Year			
Freshman	17(20.4%)	1(1%)	18(9.8%)
Sophomore	9(10.8%)	36(36%)	45(24.5%)
Junior	10(12.0%)	40(40%)	50(27.3%)
Senior	32(38.5%)	19(19%)	51(27.8%)
Graduate	10(12.0%)	4(4%)	14(7.6%)
No response	5(6%)	N/A	5(2.7%)
Major			
Business/Management	10(12.0%)	7(7%)	17(9.2%)
Engineering/Computer Science	22(26.5%)	7(7%)	29(15.8%)
Education	15(18.0%)	61(61%)	76(41.5%)
Liberal Arts/Social Science	16(19.2%)	19(19%)	35(19.1%)
Other	12(14.4%)	6(6%)	18(9.8%)
No response	8(9.6%)	N/A	8(4.3%)

Descriptive statistical analysis

The usage frequency of Web 2.0 applications from 183 participants was identified (see Table 3). There were 37% American students responded that they did not know what a blog is. On the contrary, 34% Korean students responded that they used blogs more than 7 times per week. Online video & audio conferencing tool and social virtual environments are mostly unfamiliar to participants. The data indicated that 52% of American students and 48% of Korean students did not know what an online video & audio conferencing tool is. In addition, 78% of American and 66% of Korean respondents reported that they did not know what a social virtual environment is.

Table 3. Analysis of usage frequency of Web 2.0 applications per week

Web 2.0 applications	Country	I don't know what this is	1 time	2 - 4 times	5 - 6 times	More than 7 times
Blogs	U.S.	31(37%)	31(37%)	9(11%)	2(2%)	10(12%)
	S.K.	1(1%)	26(26%)	17(17%)	22(22%)	34(34%)
Instant Messenger	U.S.	2(2%)	20(24%)	14(17%)	7(8%)	40(48%)
	S.K.	2(2%)	14(14%)	21(21%)	22(22%)	41(41%)
Online social communities (e.g., Facebook)	U.S.	10(12%)	9(11%)	13(16%)	12(14%)	39(47%)
	S.K.	5(5%)	25(25%)	36(36%)	18(18%)	15(15%)
Online video sharing (e.g., YouTube)	U.S.	7(8%)	24(29%)	26(31%)	10(12%)	16(19%)
	S.K.	4(4%)	47(47%)	27(27%)	10(10%)	12(12%)
Online video & audio conferencing tool (e.g., Skype)	U.S.	43(52%)	29(35%)	5(6%)	3(4%)	3(4%)
	S.K.	48(48%)	39(39%)	10(10%)	1(1%)	2(2%)
Social virtual environment (e.g., Second Life)	U.S.	65(78%)	12(14%)	2(2%)	2(2%)	0(0%)
	S.K.	66(66%)	18(18%)	11(11%)	2(2%)	3(3%)

Table 4 shows the technology acceptance of Web 2.0 for learning on all six Web 2.0 applications. In average, all participants had a more positive attitude towards using instant messenger and online video sharing than other Web 2.0 tools. While American participants found that instant messenger and online video sharing are the easiest to use, Korean participants had very positive attitudes toward using blogs for their learning. In average, participants felt intimidated using a social virtual environment for learning. The anxiety level associated with using all Web 2.0 tools, however, is relatively low on a 7-point Likert scale.

Table 4. Analysis of the technology acceptance of Web 2.0

		Country	Blogs	Instant Messenger	Online social communities	Online video sharing	Online video & audio conferencing tool	Social virtual environments
Performance	I would find it useful in my learning tasks	U.S.	3.49	4.23	3.42	4.93	3.61	2.95
		S.K.	4.50	4.15	4.46	4.30	3.82	3.55
	Using it enables me to accomplish tasks more quickly	U.S.	3.20	4.22	3.23	4.19	3.65	2.92
		S.K.	4.60	4.27	4.43	4.29	3.74	3.46
	Using it increases my productivity	U.S.	3.10	3.75	2.80	4.00	3.53	2.92
		S.K.	4.40	4.00	4.43	4.21	3.79	3.49
Effort Expectancy	Learning to use it is easy for me	U.S.	4.33	5.69	4.92	5.22	3.89	3.17
		S.K.	4.41	4.42	4.57	4.40	3.70	3.45
Attitude	Using it for learning is a good idea	U.S.	3.86	4.45	3.51	4.40	3.65	3.00
		S.K.	4.74	4.47	4.68	4.37	4.03	3.69
	It makes learning more interesting	U.S.	3.81	4.28	3.70	4.90	3.52	3.02
		S.K.	4.44	4.13	4.47	4.04	3.86	3.57
	I like learning with it	U.S.	3.57	4.16	3.67	4.72	3.43	3.02
		S.K.	4.19	3.87	4.33	3.96	3.55	3.38

Social Influence	People who influence my behavior think that I should use it.	U.S.	2.95	3.70	3.87	4.20	3.39	2.96
		S.K.	3.43	3.61	4.03	3.81	3.38	3.18
Anxiety	I feel apprehensive about using it	U.S.	2.62	2.60	2.73	2.52	2.86	2.92
		S.K.	4.78	5.14	4.77	4.66	3.90	3.56
	It is somewhat intimidating to me	U.S.	2.31	1.98	2.22	2.31	2.90	2.77
		S.K.	2.62	2.43	2.71	2.83	3.18	3.18

Table 5 shows the comparison of technology acceptance of Web 2.0 applications for learning from students in the U.S. and South Korea based on a *t*-test. Korean students had a more positive attitude towards using blogs compared to American students in terms of performance, attitude, social influence, and anxiety perspectives. In particular, Korean students responded that using blogs is a good idea as it makes learning more interesting. American students responded that learning to use instant messenger is easy, and it is not intimidating when compared to Korean students. In terms of performance and attitude categories of the technology acceptance, Korean students' responses in using online communities for learning are more positive than their American counterparts.

American students had a more positive attitude towards using online video sharing than Korean students. They felt that using online video sharing makes learning more interesting and they like learning with online video sharing. They felt that using online video sharing is more useful in their learning tasks. American participants responded that using online video sharing is very easy for them. They also felt less intimidated when compared to Korean respondents. The analysis further indicated a significant difference between American and Korean students in the anxiety category for all six Web 2.0 applications. Korean participants felt more anxious about using those applications than American participants. Korean respondents felt apprehensive about using online audio & video conference tool. Korean students who had experience using social virtual communities had positive attitudes compared to American respondents. In terms of performance, Korean participants responded that social virtual communities are very useful and increase their productivity. They also felt that using social virtual communities enables them to accomplish tasks more quickly when compared to American participants.

Table 5. Comparison of the technology acceptance (*t*-test)

Web 2.0 applications			<i>t</i> -test for Equality of Means				
Technology acceptance	Question	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	
Blogs	Performance	1	-3.76	133.29	0.00**	-1.01	0.27
		2	-5.47	146.83	0.00**	-1.40	0.26
		3	-5.38	141.01	0.00**	-1.30	0.24
	Effort	4					
	Expectancy		-0.28	118.35	0.78	-0.08	0.31
	Attitude	5	-3.34	124.59	0.00**	-0.88	0.26
		6	-2.49	116.52	0.01**	-0.63	0.25
		7	-2.30	121.08	0.02*	-0.62	0.27
	Social influence	8	-1.93	131.88	0.06	-0.48	0.25
	Anxiety	9	-9.41	144.33	0.00**	-2.17	0.23
10		-1.32	148.84	0.19	-0.31	0.23	
Instant messenger	Performance	1	0.34	142.41	0.74	0.08	0.23
		2	-0.22	142.64	0.83	-0.05	0.25
		3	-1.04	130.39	0.30	-0.25	0.24
	Effort	4					
	Expectancy		5.09	140.15	0.00**	1.27	0.25
	Attitude	5	-0.11	141.56	0.91	-0.02	0.22
6		0.63	127.14	0.53	0.15	0.23	

		7	1.16	137.73	0.25	0.29	0.25
	Social influence	8	0.35	141.53	0.73	0.09	0.25
	Anxiety	9	-11.38	150.06	0.00**	-2.54	0.22
		10	-2.31	181.00	0.02*	-0.45	0.20
Online social communities	Performance	1	-4.62	124.98	0.00**	-1.04	0.22
		2	-5.23	133.58	0.00**	-1.20	0.23
		3	-7.40	139.13	0.00**	-1.63	0.22
	Effort	4					
	Expectancy		1.26	112.78	0.21	0.35	0.27
	Attitude	5	-5.09	122.08	0.00**	-1.17	0.23
		6	-3.53	136.79	0.00**	-0.77	0.22
		7	-2.72	131.20	0.01**	-0.66	0.24
	Social influence	8	-				
	Anxiety	9	0.64	135.45	0.53	-0.16	0.26
		10	-8.85	141.11	0.00**	-2.04	0.23
			-2.23	181.00	0.03*	-0.49	0.22
Online video sharing	Performance	1	2.76	155.73	0.01**	0.63	0.23
		2	-0.41	144.36	0.68	-0.10	0.24
		3	-0.90	139.90	0.37	-0.21	0.23
	Effort	4					
	Expectancy		3.27	136.27	0.00**	0.82	0.25
	Attitude	5	0.11	142.05	0.91	0.03	0.25
		6	3.62	136.50	0.00**	0.86	0.24
		7	2.99	132.83	0.00**	0.76	0.26
	Social influence	8					
	Anxiety	9	1.77	181.00	0.08	0.39	0.22
		10	-9.41	159.29	0.00**	-2.14	0.23
			-2.23	181.00	0.03*	-0.52	0.23
Audio & Video conferencing tool	Performance	1	-0.82	139.31	0.42	-0.21	0.25
		2	-0.37	181.00	0.71	-0.09	0.24
		3	-1.06	146.10	0.29	-0.26	0.25
	Effort	4					
	Expectancy		0.71	138.23	0.48	0.19	0.27
	Attitude	5	-1.50	147.13	0.14	-0.38	0.25
		6	-1.38	141.42	0.17	-0.34	0.25
		7	-0.47	135.90	0.64	-0.12	0.25
	Social influence	8					
	Anxiety	9	0.02	150.29	0.98	0.01	0.25
		10	-4.37	166.83	0.00**	-1.04	0.24
			-1.11	167.04	0.27	-0.28	0.25
Social virtual Communities	Performance	1	-2.40	148.94	0.02*	-0.60	0.25
		2	-2.25	146.17	0.03*	-0.54	0.24
		3	-2.34	147.68	0.02*	-0.57	0.25
	Effort	4					
	Expectancy		-1.06	138.60	0.29	-0.28	0.27
	Attitude	5	-2.71	146.92	0.01**	-0.69	0.25
		6	-2.17	141.20	0.03*	-0.55	0.25
		7	-1.44	143.17	0.15	-0.36	0.25
	Social influence	8					
	Anxiety	9	-0.87	148.76	0.38	-0.22	0.25
		10	-2.64	150.06	0.01**	-0.64	0.24
			-1.60	181.00	0.11	-0.41	0.26

Note: *p<0.05 **p<0.01

Discussion

This study has shown that American and South Korean students tend to differ in their technology acceptance levels and the usage of Web 2.0 applications for learning. Korean students reported positive attitudes towards using blogs and participating in online social communities but they had high anxiety levels in using online conferencing tools (eg., Skype) and social virtual environments (eg., Second Life). American students perceived a high difficulty level in using several Web 2.0 applications, such as social virtual environment tools, while they felt at ease in participating in online social communities (eg., Facebook). American students felt optimistic in using instant messenger and online video sharing for learning but their survey responses showed lower levels of anxiety towards online conferencing and social virtual environments.

According to Communications Workers of America (CWA, 2009), South Korea has the fastest average Internet connection speed and the highest rate of broadband connectivity (Akamai Technologies, 2008) in the world. This technical fact, however, does not seem to support both descriptive and inference analyses of survey results since Korean students felt more anxious when using Web 2.0 applications than American students. Moreover, they were intimidated by instant messenger and online conferencing tools (eg., Skype). Regardless of which Web 2.0 applications, the study showed that Korean students are more apprehensive in using them for learning than American students.

The obvious place to look for an explanation of the differences in Web 2.0 acceptance and utilization resides in two different cultural contexts of U.S. and South Korea. Sociologists have provided useful cultural dimensions focusing on attitudes towards power distance, individualism/collectivism, and uncertainty avoidance tendencies. According to Hofstede (1994, 1998), high power distance implies that the lower power members of organizations tend to realize and accept that power is not given to them equally. Korean students responded that participating in online social communities or social virtual communities is helpful toward their learning, but the results showed that they did not use them often in comparison to American students. Due to the perceived power distance, Korean students might hesitate to share their own thoughts through online social communities even though they thought that sharing different perspectives or opinions is useful for learning. Blogs, which were preferred by Korean students, have different characteristics in comparison to online social communities. Blogs can only be updated by the author, which insulates the blog author from the effect of power distance and allows them to express his thoughts or opinions freely. Blogs might be the better place for Korean students to articulate their opinions than other Web 2.0 applications because they do not need to worry about potential criticism by other participants who might be placed at a higher level of the power hierarchy.

The second cultural difference can be inferred from communication styles (Hall, 1979). According to Hofstede (1991), South Korean is very high on their collectivism scores while Americans in general have very high individualism scores. Gudykunst and Ting-Toomey (1998) contended that individualistic cultures were associated with low-context communication while the collectivistic cultures were associated with high-context cultures. Koreans, therefore, might prefer face-to-face contacts to their counterparts in Western cultures (Triandis, 1994). People who are from individualistic cultures tend to focus on themselves as unique entities, but people from collectivistic cultures see themselves as members of a group (Triandis, 1988). In high-context cultures, meanings in communication are derived from the situation, involved social relationships, and the content. People in individualistic cultures, on the other hand, rely far less on contexts to interpret meanings of communications. They tend to focus on the content of the communication. This might explain why American students felt that using instant messenger is very easy, and do not feel intimidated by using it as IM satisfies the need to communicate on the content only. On the contrary, Korean students responded that they were intimidated by using instant messengers. They may feel that they should understand the context as well as the content of the communication. Communicating through instant messengers without a clear context might not be formal enough for Koreans, which might also lead to miscommunication due to the lack of contextual cues.

The third cultural difference may be caused by uncertainty avoidance. Uncertainty avoidance in a society is often reflected in formal educational systems. Students who are in strong uncertainty avoidance cultures prefer structured learning situations with well-organized objectives, timetables, and assignments (Hofstede, 2001). When uncertainty avoidance is weak such as in Britain or U.S., students and instructors both care less about the structure of the learning process. These low uncertainty avoidance cultures, for example, encourage students to participate in online

discussions freely. So Korean students who belong to the culture of high uncertainty avoidance might hesitate to participate in online social communities or online virtual communities.

The impact of different cultures may bring conflicts for instructors and learners in traditional learning settings that are isolated from the rest of the world (Uzuner, 2009). However, it is common to encounter students with different cultural backgrounds in learning environments that are connected by the Internet. Thus it is very important to understand the significant differences between two different cultures toward the acceptance and utilization of Web2.0 applications for learning. This study could provide practical insights for educators on how to effectively integrate Web 2.0 applications for learners coming from various cultural backgrounds (Uzuner, 2009).

The findings of this study imply that instructors in culturally diverse instructional settings should consider the relationship between cultural differences and the usage and acceptance of Web 2.0 applications to facilitate students' learning activities. Instructors also need to consider both learning objectives of the communication and cultural attitudes toward Web 2.0 applications. One way might be to intentionally choose specific Web 2.0 application for students who are reluctant to use them, as they tend to stick to specific tools based on their cultural preferences. For example, generally instant messenger is an effective tool to interact flexibly among team members. However, if the objective is to improve formal expressions of communication, instant messenger might not be a good tool for it. If the purpose is to facilitate active interactions among students, instructors should select instant messenger even though students who are from high power distance countries are not familiar with using instant messengers. Using wikis for collaborative interactions among students is another example. Students who are from high power distance countries may not comfortable contributing to wikis because they think they may have no right to delete or correct the content contributed by others. To support students' collaboration, instructors can choose wikis even though they realize students' cultural differences. In the case of unwilling students, instructors could help students to understand the purpose behind the use of the chosen Web 2.0 applications and challenge them to overcome their cultural attitudes towards the technology. The other approach might be choosing several Web 2.0 applications based on students' cultural differences. Students who have different cultural backgrounds might select different tools for their learning based on their cultural preferences.

To summarize, cultural difference may influence how students accept technology and how to use it for learning. With the inevitable trend of organizations utilizing Web 2.0 applications for educational and professional purposes, cultural issues should become an important topic. Although Web 2.0 applications themselves are neutral but users are always affected by their cultural contexts. Therefore, understanding cultural differences and their potential impact could help educators to efficiently integrate appropriate Web 2.0 tools in educational settings.

Limitations and Future Research

Given the small sample size, we are unable to generalize our findings to different instructional settings. The preliminary results, however, offer two basic principles on which to base further research. First, students from different cultural contexts do perceive and utilize Web 2.0 applications differently for learning purposes. Second, it is not difficult to see classes that include and mix students from variety of cultural backgrounds, so it is valuable to examine how such students accept, react to, and use Web 2.0 applications for collaboration among team members. Third, potential differences of Web 2.0 utilization in instructional settings are very valuable for educators. To further investigate these principles, the research team intends to conduct in-depth task analyses for all six Web 2.0 applications in similar cultural comparison settings, and align them with intended learning outcomes. As a result we will be able to optimize learners' performance in learning environments enriched by Web 2.0 applications.

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