

# Motivating Pre-service Teachers in Technology Integration of Web 2.0 for Teaching Internships

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## Abstract

The aim of this study was to examine the predictors of pre-service teachers' use of Web 2.0 tools during a teaching internship, after a course that emphasized the use of the tools for instructional activities. Results revealed that integrating Web 2.0 tools during their teaching internship was strongly predicted by participants' perceived enjoyment in using the tools in the communication technology course. The results of this study indicate the importance of active engagement and enjoyment in the integration and implementation of Web 2.0 technologies in teaching environments by pre-service teachers. As the comfort level and enjoyment increases by virtue of the employment of Web 2.0 tools by the pre-service teachers, teacher educators can expect from their students increased motivation, effectiveness, and competence in integrating technology into their curriculum.

**Keywords:** technology integration, teacher education, pre-service teacher, enjoyment

## 1. Introduction

Increasingly, technologies have offered new ways of learning and novel methods of teaching. Among those technologies, applications of Web 2.0 have been widely used among school children. For example, students now use Wikipedia for initial research instead of traditional encyclopaedias, YouTube instead of video tapes, and Facebook instead of written letters. Given its popularity and its social nature, Web 2.0 offers unique opportunities for use in the educative context. More specifically, Web 2.0 tools allow teachers and students to do more than just retrieve information. Instead, Web 2.0 tools use Web applications to foster collaboration, group contribution, information sharing, knowledge generation, and to facilitate communications with distant people (Grosbeck, 2009; O'Reilly, 2005). By adapting Web 2.0 tools into their curriculum, it is possible to move from teacher-centered to student-centered learning (Williams & Chinn, 2009). The use of various Web 2.0 technologies increases students' abilities to learn in different ways and provides them access to technological tools that better meet their learning needs and preferences (Prensky, 2005; Kale, 2014), improving the chances for the students to learn via a student-centered approach. In addition, using Web 2.0 technologies facilitates the interaction and collaboration between students and teachers, increased motivation and participation, self-regulated learning processes, effective communication, and formal and non-formal learning (Redecker, Ala-Mutka, Bacigalupo, Ferrari, & Punie, 2009). In more practical terms, Web 2.0 technologies can be cost effective, flexible, and quick and easy to use. Simultaneously, this technology promotes the integration of teaching and learning, as well as sharing of cumulated information and resources. This technology also offers independence from a specific platform, a redistribution of effort, and the creation of digital content (Grosbeck, 2009). These are some of the leading benefits of implementing Web 2.0 tools into the classroom for both teachers and students.

However, despite its benefits, the use of Web 2.0 technologies in the classroom have been quite limited arising from issues related to teaching practices and professional development. With the emergence of technology, teachers have faced many challenges, including the need to move from traditional teacher roles, competencies, and functions to newly defined ones (Balanskat, Blamire, & Kefala, 2006; Nussbaum-Beach & Hall, 2012). For example, in the student-centered learning model, teachers take on the role of facilitators and focus more on planning and supporting the students' learning; teaching is more purposeful and contributes more to students' learning progress; and teachers design learning tasks and create diverse teaching resources in line with different

learning styles and purposes (State of Victoria, 2010). The challenge for teachers when integrating Web 2.0 into the curriculum lies in their understanding of the benefits of Web 2.0 technologies and future competencies for students, developing new teaching and learning strategies, and garnering positive beliefs and attitudes regarding the impact of Web 2.0 (Cheon, Song, Jones, & Nam, 2010; Scrimshaw, 2004). Within the Web 2.0 paradigm, teachers and students become increasingly connected to each other using personal networks and social media, and they bring practical knowledge, experiences, and skills to the classroom (Nussbaum-Beach & Hall, 2012). This implementation, however, is not without problems. Although pre-service teachers might be proficient in using Web 2.0 tools, such as Twitter, blogs, or wikis (Baltaci-Goktalay & Ozdilek, 2010), those who have little or no teaching experience in the real world may not understand how to be engaged in appropriate activities using Web 2.0 technologies for the classroom (Albion, 2008; Cheon et al., 2010). This means that even for pre-service teachers familiar with the benefits of Web 2.0 technologies, they still find it difficult to establish the appropriate framework for its practical implementation because they did not gain enough hands-on experience in an actual teaching and learning environment.

Typically, pre-service teachers are not significantly motivated to integrate technologies, particularly Web 2.0 technologies, in their teaching practice. Pre-service teachers have a particularly limited opportunity to integrate technologies and to develop the appropriate understanding of needs and interests as it relates to technology integration in their teaching. According to Reeve (2009), people are motivated through experience of psychological satisfaction, while engaging in interesting activities. Responsibilities of teacher educators should include providing pre-service teachers with natural experiences of feeling competent and an innate desire for personal growth in technology integration in the classroom. In South Korea, the initial experience of technology integration for pre-service teachers occurs during the mandatory internship period. Most of the pre-service teachers will complete their internships before their graduation, in order to fulfill the graduation requirements of teacher certification, a critical component of a college's education program or the university's teacher certification program. However, the internship period is very short, consisting of a total of two months, and all teacher candidates across the country begin their internships simultaneously. Thus, they are given a limited opportunity to teach students in a formal classroom environment and to integrate technologies in their teaching activities. In addition, teacher education curricula tend not to integrate substantive technological apparatuses into the courses for future teaching practice. Thus, before working as teachers at schools, those in teacher education programs lack the competencies to integrate technology into the school settings. Additionally, it is difficult for pre-service teachers to fully grasp how integrating different technologies into the classroom will adequately satisfy the learning needs of the students. Teachers' intrinsic factors are difficult to identify and overcome because they need to restructure their belief systems about technology and develop their knowledge base for technology integration (Guzey & Roehrig, 2012).

To help prepare pre-service teachers for the successful use of technology, particularly educational tools on the web, teacher educators should identify and target meaningful methods for overcoming the challenges of integrating into classroom instruction the desired technology, Web 2.0 in this study. Many meaningful predictors have been considered to explain and predict pre-service teachers' actual use of innovative technologies, such as their attitudes, beliefs, technical competency or fluency, intrinsic motivation, and self-efficacy toward Web 2.0 tools (Albion, 2008; Anderson, 2007; Anderson & Maninger, 2007; Cheon et al., 2010; Sadaf, Newby, & Ertmer, 2012; Teo, 2009). Still, more research is necessary to more fully understand the predictors of the actual use of Web 2.0 technologies in the classroom by pre-service teachers.

Pre-service teachers may lack engagement or positive experiences in the use of Web 2.0 tools, which are more connected to each other, more purposefully adaptable according to contents, and actively support various class activities (e.g., collaboration, sharing information, and generating knowledge). However, the pre-service teacher's enjoyment as a determinant in behavioral intention or actual use is not commonly found in educational contexts. In this study, we examined pre-service teachers' experiences in a technology integration course focusing on Web 2.0 technologies and the subsequent impact on their internship practices. For this, we conducted a direct logistic regression analysis to examine meaningful predictors that could significantly predict the use of Web 2.0 tools by pre-service teachers.

### *1.1 Why Web 2.0 Technologies Should Be in Education*

Based on the core ideas of Web 2.0, researchers (e.g., Grosseck, 2009) have posited that using Web 2.0 technologies can greatly influence and increase the teachers' educational activities in the digital classroom. The educational potential of Web 2.0 technologies extrapolates on the educational ideas and pedagogical approaches of the Web 1.0 era. Whereas students and teachers in Web 1.0 were focused on searching the Internet, posting content, and downloading prepared information, students and teachers in Web 2.0 are focused on connecting

information, collaborating and sharing with others, and developing interactive content and applications for classroom activities, which allows them to be more actively engaged with one another (Thomas & Li, 2008). Recently, these characteristics of Web 2.0 technologies have gained advocates who support the integration of Web 2.0 tools for teaching and learning activities to develop the core competencies for the globalized twenty-first century, and to continuously foster these competencies into the future. These competencies include creative thinking, collaboration, digital literacy, critical thinking, and communication (Ananiadou & Claro, 2009; Partnership for 21st Century Skills, 2007; Trilling & Fadel, 2009). With Web 2.0 technologies, teachers in the digital classroom can gather and share information, create a community of practice, evaluate students' progress, and have students develop projects collaboratively.

Web 2.0 technologies support interactive participation in practical activities; in education, they contribute to individual students' knowledge building and sharing through collaboration. Some basic features of Web 2.0 technologies for developing knowledge include collaboratively writing, editing, and sharing, and then using the shared knowledge garnered from the collective efforts to develop ecosystems of knowledge. The knowledge ecosystem based on Web 2.0 features supports an effective framework to help establish personal cognitive functions through social activities, which is the basic premise of social constructivism (Kang, 1998; McDuffie & Slavitt, 2003; Wertsch, 1991). Also, Web 2.0 technologies support the building of an interactive learning environment for teachers and students (Hartshorne & Ajjan, 2009; Hossain & Quinn, 2014). According to Reeves (1998), the interactive classroom environment can be learner-centered, focusing on students seeking information for solving problems, performing tasks, demonstrating their newly gained knowledge to teachers, and performing collaborative activities. The learner-centered interactive environment can be implemented through many useful functions in a Web 2.0 application (Anderson, 2007).

### *1.2 Pre-Service Teachers' Motivation on Technology Integration*

Much research has been conducted on the impact of the teachers' internal motivators regarding the integration of a new technology in teaching (e.g., Anderson & Maninger, 2007; Cheon et al., 2010; Cullen & Greene, 2011; and Teo & Noyes, 2011). These discussions address some of the underlying causes of a teacher's behavior as it relates to motivation, which entails internal processes that give the behavior its energy and direction (Reeve, 2009). The teachers' motivations for performing a target behavior are influenced by their self-efficacy beliefs, expectations, self-concepts, or emotions. When pre-service teachers have positive experiences after undergoing challenging tasks in teaching, there is a greater chance of an increase in their positive outlook in future teaching situations (Wood, Mueller, Willoughby, Specht, & Deyoung, 2005).

The most self-determined form of motivation is intrinsic motivation, in which human action is motivated by interest, enjoyment, pleasure, and satisfaction generated by the activity itself (Deci & Ryan, 1985; Ryan & Deci, 2000). There are two different approaches to intrinsic motivation. For example, Ryan and Deci (2000) posit that "because intrinsic motivation exists in the nexus between a person and a task, some authors have defined intrinsic motivation in terms of the task being interesting while others have defined it in terms of the satisfactions a person gains from intrinsically motivated task engagement" (p. 56). The former follows the tradition from operant theory (Skinner, 1953) which emphasizes how the tasks should be organized in an interesting manner, while the latter focuses on providing satisfaction for innate psychological needs, such as competence, autonomy, and relatedness. Although Ryan and Deci, who proposed self-determination theory, emphasize psychological needs, they also recognize that "basic need satisfaction accrues in part from engaging in interesting tasks" (p. 57).

When it comes to adopting new technologies in teaching, teachers' poor technology skills and motivation influence their level of engagement in using technology for pedagogical purposes (Balanskat et al., 2006). Pre-service teachers have demonstrated that self-efficacy beliefs toward integrating technology are related to their future successful teaching practices (Anderson, 2007; Anderson, Groulx, & Maninger, 2011; Sadaf et al., 2012). Also, low internal motivation (e.g., self-efficacy, belief, or enjoyment) about using technology can negatively affect the actual use of technology (Kiraz & Ozdemir, 2006; Legris, Ingham, & Colletette, 2003).

### *1.3 Enjoyment Experience Factor in Technology Integration*

Pre-service teachers' positive affect, or pleasant emotional experience, appeared to influence teaching behavior in classroom settings, particularly for innovative or different teaching methods. Research findings revealed that pre-service teachers' intentions to integrate technology is influenced by intrinsic factors, including personal beliefs and rationale behind the integration of technology into the curriculum (Anderson & Maninger, 2007). According to researchers, positive affect is a powerful source of motivation, an internal drive that something must be done (Lang, 1995; Plutchik, 1997). This means people who have affective reactions can motivate their

behaviors that promote productive success (Plutchik, 1980). As one of the motivational elements causing teachers' target behavior, enjoyment refers to the extent to which an activity performed using technology is perceived to be pleasant in its own right aside from any performance consequences (Davis, Bagozzi, & Warshaw, 1992).

As a well-known theory on technology integration and adaptation, the technology acceptance model has been extensively researched, particularly the relationship with users' perceived enjoyment and technology use. Users' enjoyment has been considered a significant intrinsic factor of behavioral intention during actual use of technology (Davis et al., 1992; Venkatesh, 2000; Yi & Hwang, 2003; Liao, Tsou, & Shou, 2008). Perceived enjoyment is considered an antecedent of a user's cognitive behavior and a critical factor in learning, as it can explain a state of cognitive absorption of given tasks. It also helps to be in a state of deep involvement by a user with specific software for future adaptations and to satisfy needs (Gomez, 2010). Enjoyment as an intrinsic motivator provides a perception of competence in challenges and tasks (Deci & Ryan, 1995). Likewise, enjoyment through the adoption of technology significantly influences positive attitudes and reinforces intentions to use the technology (Davis, 1989; Moon & Kim 2001). Research has found that people will be more motivated to employ targeted activities that are enjoyable, compared to those that are not (Suki & Suki, 2011). Research findings also reveal that when people experience enjoyment while using technology, their intrinsic motivation to affect certain behavior regarding the use of technology increases (Venkatesh, 2000; Venkatesh, Speier, & Morris, 2002). Demonstrating this idea, Hsu and Lin (2008) reported that users' perceived enjoyment of using blogs is a significant factor in explaining the likelihood of behavioral intention to use blogs.

#### *1.4 Research Questions*

To identify the determinants of pre-service teacher's integration of Web 2.0 tools in their teaching practice, it is necessary to examine the cognitive functions (e.g., motivation, attitude, or intention) that can predict with higher probability the teachers' actual adoption in future teaching practices.

The purpose of the present study was to examine the specific variables that could best predict the actual integration of Web 2.0 tools in the teaching practice of pre-service teachers during an internship. The results of this study may provide insights on how to best educate pre-service teachers to integrate technology, particularly Web 2.0 technologies, into digital classrooms. The following three research questions guided this study:

- 1) To what extent does a model consisting of motivational variables predict the actual use of Web 2.0 tools by pre-service teachers in their teaching practice?
- 2) Which predictor has a substantive impact on the actual use of Web 2.0 tools by pre-service teachers in their teaching practice?
- 3) What are the educational implications for teacher educators with technology integration using Web 2.0 tools?

In the present study, beyond predicting behavioral intentions or attitudes in the investigation of technology integration, we were more interested in predicting the actual use of Web 2.0 tools. According to the theory of planned behavior about the relationship between beliefs and behavior (Ajzen, 2002), people's behavioral intentions, or readiness to perform a given behavior, prove an incomplete determinant in solely predicting the individual's behaviors. Therefore, the use of the respondents' information on their actual usage of Web 2.0 tools, instead of using people's often-measured intentions or attitudes, will provide better access to the real predictors.

## **2. Methods**

### *2.1 Participants*

This study was conducted with 102 senior students enrolled in a technology course at a national university for pre-service teachers in the South Korea. Participation was voluntary and agreed with the completion of questionnaires. The pre-service teachers in this study included 23 males (22.5%) and 79 females (77.5%), ranging in age from 21 to 33 years ( $M=23.81$ ,  $SD=1.96$ ). Prior to taking the technology course, most of the students did not have experience in the educational use of Web 2.0 tools or services in the educational field (e.g., an internship).

### *2.2 Measures*

An online, two-part survey instrument was designed to measure the response variables in the research model. The first part of the survey asked the participants to provide their demographic information. The second part included 11 items on the four constructs regarding pre-service teachers' technology acceptance. Participants' gender was coded as 1 = male and 0 = female. To develop a statistical model that could be used to predict the probability of pre-service teachers' actual use of Web 2.0 tools in teaching practice, we adapted the

well-developed framework from the Technology Acceptance Model (TAM) to measure the participants' perspectives on technology acceptance, including usefulness, ease of use, enjoyment, and intention to use Web 2.0 tools. Numerous research findings have proven the effectiveness of the factors in the TAM in predicting a user's intention to implement a specific technology (Cheon et al., 2010; Hu, Clark, & Ma, 2003; Teo, 2009). The technology acceptance component of the questionnaire leveraged and adapted the TAM as developed by Davis (1989) to address the issue of how users accept and use technology. The 11 items on the survey examined which factors statistically contributed to the actual use of Web 2.0 tools during the participants' teaching internship. As predictor variables in the logistic regression, the item categories included perceived usefulness, perceived ease of use, perceived enjoyment, and behavioral intention of using Web 2.0 tools. Perceived usefulness, perceived ease of use, and behavioral intention were measured by three items modified from Davis (1989). The items related to perceived enjoyment were measured by three items modified from Yi and Hwang (2003). All items were measured using a 5-point Likert-type scale ranging from strongly disagree to strongly agree. At the end, we created four factors to represent the predictor variables in our analyses. The items used to construct each factor are summarized in Table 1.

Table 1. Descriptive statistics of predictors and reliabilities

Factor	Item	<i>M</i>	<i>SD</i>	<i>α</i>
Usefulness (Davis, 1989)	Using Web 2.0 tools will improve my competence to teach well.	4.06	.59	.78
	Using Web 2.0 tools will enhance my effectiveness.	4.03	.65	
	Using Web 2.0 tools will increase my productivity.	3.97	.64	
Ease of Use (Davis, 1989)	Using Web 2.0 tools is clear and understandable.	3.25	.75	.62
	I find it easy to get Web 2.0 tools to do what I want them to do.	3.93	.68	
	I find Web 2.0 tools easy to use.	3.27	.80	
Enjoyment (Teo & Noyes, 2011)	Teaching is more interesting with Web 2.0 tools.	3.92	.66	.82
	Using Web 2.0 tools is fun.	3.98	.63	
	I like using Web 2.0 tools.	3.75	.71	
Behavioral Intention (Davis, 1989)	I will use Web 2.0 tools in the future.	4.14	.60	.79
	I plan to use Web 2.0 tools often.	3.84	.70	

### 2.3 Procedures

Before completing the two-part survey, students attended an 8-week technology course focused on Web 2.0 technology, content development and management, and practical implementation of Web 2.0 capabilities to maximize its features and applications. The course addressed Web 2.0 features that promoted participation, openness, sharing, and collaboration, as well as an introduction to the use of relevant tools for educational activities. In addition, the students were tasked with development of their own ideas for classroom activities that they could implement during their upcoming mandatory 1-month internship and create artifacts using Web 2.0 tools. Each classroom in the school for the internship have a teacher computer and projection screen with high-speed internet. Thus students can use classroom technologies for their internship activities. For the course, Web 2.0 tools were selected based on a set of five criteria: (1) must be sufficiently intuitive for the user to learn in 30 minutes; (2) must include collaboration, participation, and sharing capabilities; (3) must have broad application across academic subject areas (cannot be subject- or topic-specific); (4) should be free to use; and (5) should be usable as a web-based tool without downloading to a desktop. The Web 2.0 tools and activities used in the course met the above criteria and were assessed as appropriate for pre-service teachers to learn how to use for their future classrooms. Table 2 illustrates the week breakdown of the tools and activities of the eight-week technology course.

After completing the course and before beginning their internship, the students participated in a two-part questionnaire that gathered their background data and multiple questions regarding their technology acceptance.

All participants were volunteers and provided with information about the purpose of the research and protection of privacy and confidentiality in the front page of the online survey. They were made aware that they did not need to participate in the survey. One hundred and two students agreed to participate in the study by completing the survey. Within the questionnaire upon the return from their internship, the students also submitted a reflection paper that described their experiences in using information and communication technologies (ICTs) during the internship. Students were asked to respond to the following questions in their reflections: (1) What were your experiences with using ICTs during your internship? (2) What do you want to tell future internship students regarding ICT knowledge and skills? (3) Do you think you need to learn more about ICTs as a teacher?

Table 2. Web 2.0 tools and class activities

Week	Web 2.0 tools and class activities
	Understanding Web 2.0
1	Using practical cases of using various Web 2.0 tools (e.g., YouTube, Wikipedia, Google Person Finder, and Flickr)
	Understanding Wiki
2	Using a wiki service for the course (PBworks)
	Understanding and using blogs for educational purposes
	Understanding and using microblogging (Twitter)
3	Understanding and using Facebook
	Performing short projects and posting on the course wiki
	Creating word clouds from text (Tagxedo)
	Using Kerpoof to practice multimedia tools for storytelling, art, and writing
4	Using an online whiteboard to draw, share, and collaborate in real time (Dabbleboard)
	Performing short projects and posting on the course wiki
	Using Google tools, including Google Body Browser
5	Using Google Maps and creating a mash-up of Google Maps
	Performing short projects and posting on the course wiki
	Using Google Art Project
6	Using Google docs and spreadsheets
	Performing short projects and posting on the course wiki
	Using Google documents, presentations, and surveys
7	Performing short projects and posting on the course wiki
	Using online photo editing tool (pixlr)
8	Discussing and summarizing application ideas of using Web 2.0 tools
	Performing short projects and posting on the course wiki

Based on the content analysis of the students' reflection papers, we examined what Web 2.0 tools students actually used during their internship. The analysis results of the reflection papers were coded as a dichotomous outcome variable, where 0 indicated non-occurrence and 1 indicated occurrence of the actual use of Web 2.0 tools in their teaching practice during their internship. We examined what Web 2.0 tools students integrated in their internship classes, such as Blog, Google docs, and Prezi for storytelling.

#### 2.4 Data Analysis

A logistic regression analysis was performed to identify the factors that affect the occurrence of the actual use of Web 2.0 tools in teaching practice. Logistic regression is a versatile and flexible modeling strategy that predicts

the probability of an event occurring (Hosmer & Lemeshow, 2000; O'Connell & Amico, 2010). It provides a modeling strategy for the analysis of binary data, designated as either  $Y = 1$  for case or  $Y = 0$  for non-case (O'Connell & Amico, 2010). Logistic regression can also evaluate the relationship between one binary outcome variable and several response variables. In this study, the outcome was dummy coded, either as an internship lesson using Web 2.0 tools (outcome = 1) or a lesson not using Web 2.0 tools (outcome = 0). Predictor variables included gender, perceived usefulness, perceived ease of use, perceived enjoyment, and behavioral intention.

The logistic regression model was evaluated using test statistics. The maximum-likelihood method was used to estimate the coefficients,  $\beta_1, \beta_2, \dots, \beta_i$ , in the logistic regression. The Hosmer-Lemeshow test, Cox and Snell (1989) R square, and Nagelkerke (1991) R square were applied to evaluate for a goodness-of-fit of the model (Peng, Lee, & Ingersoll, 2002). Descriptive and modeling analyses were conducted using IBM SPSS version 18. Logistic regression was completed to determine which response variables were statistically associated with outcome variables.

### 3. Results

To what extent does a model consisting of demographic variables and perceived variables predict the actual use of Web 2.0 technologies by pre-service teachers in their teaching practice? A total of 102 pre-service teachers completed the online questionnaire. This sample population represented the total pre-service sample population for the study. The outcomes of the pre-service teachers for non-occurrence (38.2%) and occurrence (61.8%) in the integration of Web 2.0 tools during their internship teaching practice are found in Table 3.

Table 3. Descriptive analysis of outcome variables based on two events (occurrence, non-occurrence)

Actual use of Web 2.0 tools in internship teaching practice	Gender		
	Total (%)	Male (%)	Female (%)
Total	102 (100.0)	23 (22.5)	79 (77.5)
Non-Occurrence (coded as 0)	39 (38.2)	11	28
Occurrence	63 (61.8)	12	51

The logistic regression model examined six variables to predict the actual use of Web 2.0 tools in their teaching practice by pre-service teachers. These predictors included background variables (age, gender) and perception variables (perceived usefulness, perceived ease of use, perceived enjoyment, and behavioral intention). The results indicated that the full model containing all six predictors fit well (Hosmer-Lemeshow test [Chi-Square = 8.775,  $df = 8$ ,  $p > .362$ ]), which meant that the model could distinguish between respondents who used and did not use Web 2.0 tools during the internship. The values of Cox & Snell R square and Nagelkerke R square were .101 and .138, respectively. The predictor variables accounted for about 14% of the variability of the outcome.

Which predictor has a substantive impact to the actual use of pre-service teachers in teaching practice? In order to distinguish the predictors that had a substantive relationship to the actual use of Web 2.0 tools by pre-service teachers, predictor variables in the logistic regression were examined. Table 4 presents the logistic regression coefficient, standard error, Wald test, and odds ratio. Only one of the predictors, perceived enjoyment of using Web 2.0 tools (enjoyment), was significantly different. This indicated that respondents who used Web 2.0 tools in the technology course were over 1.5 times more likely to use Web 2.0 tools later in their teaching practice when participants' perceived enjoyment in using the tools in the communication technology course. In the model, we identified that perceived enjoyment toward Web 2.0 tools was the only significant independent variable in the model to predict the use of Web 2.0 in the internship ( $p < .05$ ).

Table 4. The results of logistic regression predicting likelihood of use of Web 2.0 tools in teaching practice

	Beta Estimate	Standard Errors	Wald Test Static	<i>p</i>	Odds Ratio
Gender (Male = 1, Female = 0)	-.743	.520	2.038	.153	2.102
Age	-.034	.112	.094	.759	.966
Ease of use of Web 2.0 tools	.141	.162	.759	.384	1.152
Usefulness of Web 2.0 tools	-.019	.195	.010	.922	.981
Enjoyment of Web 2.0 tools	.431	.194	4.966	.026	1.539
Behavioral intention of using Web 2.0 tools	-.237	.284	.695	.405	.789

#### 4. Discussion

The goal of this study was to provide experiences with Web 2.0 tools via a technology course, as well as to investigate intrinsic motivations of Web 2.0 users. Too, this study endeavored to examine perceptions of Web 2.0 tools that could best predict the actual integration of these tools in the teaching practice of pre-service teachers during an internship. In addition, a logistic regression model was examined to develop a model for predicting the adoption and implementation of Web 2.0 tools by pre-service teachers in their internship; thus, the determination of effectiveness of the technology course focused on the integration of Web 2.0 tools in the classroom. Next we assessed which factors in the model are the important explanatory factors for the use of Web 2.0 tools by pre-service teachers.

From the statistical analysis, pre-service teachers' enjoyment of Web 2.0 tools after the technology course was the sole significant predictor of actual employment of Web 2.0 technologies during the internship, which demonstrates that teachers' intrinsic motivational factor can be a strong predictive variable of integrating technology into the classroom curriculum. This result correlates with findings (Davis & Wiedenbeck, 2001; Venkatesh, 2000; Venkatesh, Speier, & Morris, 2002) that suggest that when people experience enjoyment while using technology, their intrinsic motivation regarding the use of technology increases. Interestingly, other factors in the predictive model, including usefulness, ease-of-use, and behavioral intention, did not significantly explain the actual use of Web 2.0 tools as much as the enjoyment factor. A possible explanation is that the actual use, instead of perceptions of the use, of Web 2.0 tools might be influenced more by personal inherent motivational factors rather than usability-related factors originating from the characteristics of the tools (Davis & Wiedenbeck, 2001). Even though a strong predictor of actual technology use is behavioral intention (Turner et al., 2010), this present study did not reveal similar results with previous research findings. Nevertheless, our results correlate with findings that usefulness and ease-of-use are poor predictors of actual usage (Legris et al., 2003; Turner, Kitchenham, Brereton, Charters, & Budgen, 2010).

When pre-service teachers achieve progress and develop skills in technology integration, they can feel a strong sense of satisfaction. Indeed, to take the next steps in leveraging such technologies into their classroom activities necessitates a sense of satisfaction. When teachers are engaged with pedagogically exciting and interesting challenges or tasks, the teachers' positive experiences are often associated with a feeling of meaningfulness (Pintrich, 2003). Likewise, adult learners prefer to engage in meaningful learning when able to relate new knowledge to their existing cognitive frameworks (Foley, 2004). We also characterize as intrinsically motivated people who engage their interests and exercise their capacities to find and master challenges for personal and professional growth (Reeve, 2009). When people are intrinsically motivated, their behavior reflects their interest in the fun and challenge of the activity (Davis & Wiedenbeck, 2001). Thus, we can expect those intrinsically motivated pre-service teachers to demonstrate their aspirations to effectively integrate technologies into their future teaching activities. Moreover, it proves important to consider the task's properties and their potential intrinsic interest, as well as to provide satisfaction of innate psychological needs to pre-service teachers. Enjoyment as the one significant predictor to the actual use of Web 2.0 tools in the internship may have been supported by their active participation with practical topics, their ability to share outcomes of course activities using Web 2.0, and the fact that the technology tools were easy to use, even for non-experts, all of which could contribute to positive experiences and emotions.

Our findings can elucidate the importance of the design of teacher education programs that integrate using Web 2.0 tools. In this study, pre-service teachers participated in a technology course that focused on Web 2.0

technologies. The technology course provided to the pre-service teachers before their internships focused on real-world issues in classroom teaching, class projects using Web 2.0 to solve problems, and their experiences related to the usefulness and ease of use of Web 2.0 tools. Pre-service teachers had to develop their own ideas for classroom activities and create artifacts using Web 2.0 tools. Our findings might expose future teachers to the efficacy of Web 2.0 tools employment in classroom settings. Most importantly, based on the study design and findings, teacher education programs must cater to pre-service teachers' interests, exercising their skills and capabilities to seek out and master targeted challenges that ultimately induce in educators a sense of satisfaction. Teacher educators should consider and develop more active and engaging programs to increase the comfort level and enjoyment of specific advanced technologies, like Web 2.0, for future adoption and incorporation into the classrooms.

Reeve's (2009) conceptual framework reveals that intrinsic motivation emerged from psychological needs and innate strivings for growth. When pre-service teachers initially have to understand the need regarding technology integration, particularly Web 2.0 tools, teacher education programs have to include the reason for the use of the targeted technology in the school context. The need for competence in technology integration generates the willingness of pre-service teachers to seek out challenges and engage in relevant tasks with strong interest (Reeve, 2009). Thus, educators have to develop and design more active learning activities, such as projects, case studies, and real-world problems to provide more challenging activities and scenarios. One necessary outcome to achieve through teacher education programs is the goal of increasing the intrinsic motivation to integrate technology, in this case Web 2.0, so that the pre-service teachers are comfortable and genuinely want to teach using these technologies. During teacher education programs, the experiences of pre-service teachers may critically influence their future teaching endeavors within the school context. Researchers emphasize the importance of the quality of the teacher education programs and early teaching experiences during the pre-service teachers' traineeships (Bruinsma & Jansen, 2010). The goal of educating pre-service teachers is to develop their competence for future teaching roles and to increase their ability to effectively integrate and apply ideas and tools found within their surroundings. Pre-service curricula should aim to develop pre-service teachers' skills and improve their capacities and potential for technology integration.

Overall, Web 2.0 technologies can provide teachers with new ways to engage students with instructional activities. Although the value of using Web 2.0 technologies is generally appreciated by pre-service teachers, they might have low confidence and low motivation in integrating the technologies in their classrooms, e.g., during an internship, because they do not have sufficient pedagogical knowledge of and real-world experiences with technology-integrated teaching (Anderson & Maninger, 2007; Wood et al., 2005). Thus, it is valuable to examine meaningful determinants of the actual use of Web 2.0 tools in teaching by pre-service teachers. Additionally, efforts need to be made to improve pre-service teachers' motivational elements considered important in influencing technology integration, as well as to promote positive emotional experiences in actual circumstances to impact the integration of Web 2.0 tools in teaching activities.

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