



UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

**EXPLORING FACTORS AFFECTING STUDENTS' USAGE AND
ADOPTION OF WEB 2.0 TECHNOLOGIES AT SCHOOL OF
COMPUTING AND INFORMATICS, UNIVERSITY OF NAIROBI:
THEORY AND EMPIRICAL TESTS**

By

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Information Systems of the University of Nairobi**

DECLARATION

STUDENT

I, the undersigned, declare that this project is my original work and that it has not been presented in any other University or Institution for academic credit.

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This research project has been submitted for examination with my approval as University Supervisor.

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DEDICATION

This research project is dedicated to my beloved husband Justus and my dearest children Lawrence, Elizabeth, Moses and Victor.

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First and foremost, my utmost gratitude goes to the Almighty God for blessing me with the ability to take this task and accomplish it well. Thanks to you God Almighty.

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ABSTRACT

Frequent technological innovations have increased the desire of students to adopt new technologies in their learning processes. Although a lot of studies have highlighted how teaching and learning can benefit from the inclusion of Web 2.0 technologies like blogs, wikis, and social bookmarking, there is insufficient report to support that indeed students use these emerging technologies in their learning processes. The purpose of this study was to assess students' awareness of the benefits of Web 2.0 to supplement conventional learning and better understand their decisions to adopt these tools using the decomposed theory of planned behavior (DTPB) model.

A survey study was conducted with the help of structured questionnaire on 120 students (out of total population of 536). A total of 120 self-administered questionnaires were distributed among 1st years, 2nd years, 3rd years, 4th years and masters' students by adopting stratified random sampling. 85 valid samples were collected and analyzed.

Findings indicated that while some students feel that some Web 2.0 technologies could improve their learning, their interaction with staffs and with other peers, their writing abilities, and their satisfaction with the courses; few choose to use them in their study. Additional results indicated that students' attitude and their perceived behavioral control are strong indicators of their intention to use Web 2.0 technologies. A number of implications are drawn highlighting how the use of Web 2.0 technologies could be useful in learning.

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LIST OF ABBREVIATIONS

- CERN – Conseil Européen pour la Recherche Nucléaire or European Council for Nuclear Research
- DTPB- Decomposed Theory of Planned Behavior
- MSC- Master of Science
- SPSS- Statistical Package for Social Scientists
- SCI - School of Computing and Informatics
- TPB - Theory of Planned Behavior

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Within 15 years the Web has grown from a group work tool for scientists at CERN into a global information space with more than a billion users (O'Reilly, 2005a). Currently, it is both returning to its roots as a read/write tool and also entering a new, more social and participatory phase. These trends have led to a feeling that the Web is entering a second phase, a new, improved Web version 2.0. The report establishes that Web 2.0 is more than a set of 'cool' and new technologies and services, important though some of these are. It has, at its heart, a set of at least six powerful ideas which include: individual production and user-generated content, harness the power of the crowd, data on an epic scale, architecture of participation, network effects and openness that are changing the way some people interact. Secondly, it is also important to acknowledge that these ideas are not necessarily the preserve of 'Web 2.0', but are, in fact, direct or indirect reflections of the power of the network: the strange effects and topologies at the micro and macro level that a billion Internet users produce (Wheeler, 2009).

In particular, the familiar web browser has become more versatile. It has allowed a wider range of user interactions, with such interactions being pursued within just this single desktop application. All of these circumstances have led to a more participatory experience of internet use. Thus, Web 2.0 has provided a version of internet experience that encourages individual users to upload: that is, to offer up their own contributions to a vast and interleaving exchange. This is implicitly contrasted with the former (Web 1.0) experience of the internet, which was

more a matter of downloading: that is, accessing the contributions of a much smaller set of information providers. In sum, the barriers to production and distribution have been loosened: an invitation for widespread participation is in place (Dearstyne, 2007).

The consequence of this increased participation is that the internet has become a much larger enterprise of knowledge building, involving a larger constituency of participants. However, that building of knowledge has not been simply a matter of individual users making their isolated contributions. The communication and data management resources of the internet have encouraged new forms of collaboration and coordination. These, in turn, have made possible novel, less planned forms of knowledge building. Such developments have created a demand for new tools to manipulate digital formats (especially images and video), and new tools to navigate this increasingly rich network of knowledge and experience (Madden and Fox, 2006).

Web 2.0 technologies have become a critical enabler of learning in the 21st century. These technologies enable students to communicate, collaborate and form teams which are skills necessary in the 21st Century. These technologies include blogs, wikis, social networking e.t.c. that students frequently use besides the usual conventional methods like classroom-based instructions and writing. They are able to capture thoughts, create to-dos and set reminders with just a simple phone call hence one can interact with others across all cultures. Other opportunities include creation of documents, spreadsheets and presentations online web-based word processor that allows real-time collaborative writing, managing schedules online and coordinating with friends and family as well as self-generating tag applications. In addition to the 21st digital skills they are easily integrated tools and teaching resources to support collaborative student-centered learning, enhance their classroom instruction with lesson plans, interactive activities and other online resources (Conole and Alevizou, 2010). Furthermore, they encourage

a wider range of expressive capability, facilitate more collaborative ways of working and furnish a setting for learner achievements to attract an authentic audience.

Higher education also plays a crucial role in developing digital skills of both those entering the labour market and those from the existing workforce (Fonstad and Lanvin, 2009). It is argued that Web 2.0 technologies could enable universities to reinvent themselves through more collaborative approaches to learning, innovations in teaching practices, and improved quality of student learning (Conole and Alevizou, 2010).

At the same time, the affordances of Web 2.0 technologies seem to harmonize well with modern thinking about educational practice (Madden and Fox, 2006). In particular, they promise learners new opportunities to be independent in their study and research. These technologies come with new online word processor, perfect for writing reports, proposals, and anything else needed to access online or work on with others. To encourage these possibilities, Web 2.0 tools have evolved that create distinctive forms of support for learning and for independent research in this new digital era.

1.2 Statement of the Problem

Internet technologies such as e-mail, course websites, and newsgroups have added value to traditional classroom knowledge delivery and have impacted the course delivery and design in many colleges and universities (Barnett, Keating, Harwood, and Saam, 2004). In the past few years a new wave of Internet technologies, Web 2.0, has emerged with the potential to further enhance the teaching and learning environment in higher education. With the use of Web 2.0 technologies, students no longer access the web only for course information; instead they access and create collective knowledge through social interactions (Maloney, 2007). Now, the

use of Web 2.0 technologies enables students to connect different pieces of information and create new information that could be shared with others (Maloney, 2007).

Many studies in the past have shown that technology use in the classroom has increased over the past years; however, this use has been primarily limited to content delivery, such as accessing course materials. Because of this, coupled with the emergence of Web 2.0 technologies into the everyday life of students, it is important to explore students' use and adoption of these technologies in supportive of their learning.

1.3 Objectives of the Study

The objectives of this study are:

- i) To assess students' awareness of the benefits of using Web 2.0 technologies in supportive of their learning.
- ii) To assess their adoption of such technologies using the Decomposed Theory of Planned Behavior (DTPB).

1.4 Research Questions

- 1 Are SCI students aware of the benefits of using Web 2.0 technologies to supplement the traditional classroom methods?
- 2 What factors best predict students decision to use Web 2.0 technologies to supplement the traditional classroom methods?

1.5 Justification of the Study

Adaptation of latest technologies for example Web 2.0 technologies is important for institutions of higher learning in Kenya. School of Computing and Informatics is one of the many schools of

higher learning institutions in Kenya mandated with the responsibility to produce technology competent students. While the school's achievement can be rated to be high in producing such students, it still employs a lot of conventional methods of learning.

1.6 Significance of the Study

The study is very significant to students who would wish to adopt latest technologies in the learning processes since it will enable them have a clear picture of the benefits that accrue from embracing web 2.0 technologies. This study would contribute to existing literature on the adoption of Web 2.0 technologies on higher education. Therefore, researchers with interest to contribute to Web 2.0 technologies on students` learning processes and educators would benefit from the results of this study.

1.7 Assumption of the Study

The study assumed that the intended respondents were available and in a position to respond to the questionnaires and interview questions used during data collection. The study further assumed that respondents had access to internet enabled-computers and other wireless technologies such as cellular phones.

1.8 Scope of the Study

This study focused on students of School of computing and informatics, University of Nairobi during the period between March and June 2013.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Web 2.0, sometimes referred to as the "read/write Web", provides online users with interactive services, in which they have control over their own data and information (Madden and Fox, 2006; Maloney, 2007). Examples of Web 2.0 participatory technologies include wikis, blogs, instant messaging, internet telephony, social bookmarking, and social networking sites. These new technologies make sharing content among users and participants much easier than in the past and change the way documents are created, used, shared, and distributed (Dearstyne, 2007). In fact many companies have adopted Web 2.0 applications to foster internal knowledge sharing and collaboration through document sharing portals (Dearstyne, 2007). In the past few years, the blooming of online social networks to exchange personal information, photos, videos (Facebook, Flickr, YouTube), and the increased need for tools to quickly create, analyze, and exchange the ever increasing amount of information, along with the ease of use of Web 2.0 collaboration software, have fueled a surge in the emergence of Web 2.0 technologies (Dearstyne, 2007). In this review of the literature, a brief history of Web 2.0, an overview of a variety of Web 2.0 technologies, and pedagogical affordances of Web 2.0 technologies are discussed.

2.1 Web 2.0 Technologies

The Web 2.0 "read/ write" idea is not new. Prior to wikis, blogs, social bookmarking, and social networking, there were listservs, groupware, and web-based communities linking people with common interests (Alexander, 2006). However, the openness of these new applications, allowing anyone to modify content, make Web 2.0 technologies different (Alexander, 2006).

Users now play a more fundamental and active role in information architecture (Alexander, 2006). Web 2.0 applications replace the traditional authoritative media delivery institutions with the wisdom of the crowd (Madden and Fox, 2006). In this study, there was a focus on the following four types of Web 2.0 collaboration tools: blogs, wikis, social networking, and social bookmarking.

2.1.1 Blogs

Blogs (abbreviated from weblogs) are user journal entries in the form of text, images, and links to web content, such as websites or other blogs. Blogs have a variety of formats and might include the user expressing their opinion about a topic or documenting activities. Blogs are interactive in the sense that other users could provide comments on the information posted by the blog author. Educational applications of blogs include researching, tracking, interpreting, and evaluating blogs for political commentary (multiple perspectives), cultural events, business, or other news and for examining changes over time (Alexander, 2006).

2.1.2 Wikis

Wikis (What I Know Is) refer to collaborative websites that allow users to interact by adding, removing, or editing site content. The most well-known wiki implementation is Wikipedia (<http://www.wikipedia.org/>). Wikipedia allows users to modify encyclopedic entries by creating a reviewer and editing structure (Alexander, 2006). Wikipedia is shaped by the wisdom of the users and it is the richest source of information and terms especially for younger people (Madden and Fox, 2006). Illustrating the increasing popularity of wikis, a study conducted by the Pew Research Center found that 30% of Internet users visit Wikipedia to search terms and meanings (Madden and Fox, 2006). Interestingly, 24.25% of these users are between the ages of 18-24. In this same age group, only 14.94% use Encarta's Online Encyclopedia

(<http://encarta.msn.com/>). Wikis are useful in educational settings in that they support individualized learning, allowing for more socially defined search structures and promote collaboration through group editing and peer review (Alexander, 2006).

2.1.3 Social networking

Social networks allow users to create personal profiles and establish a variety of networks that connect him/her with family, friends, and other colleagues (Lenhart and Madden, 2007). According to a recent Pew Research Center survey, about 55% of all online Americans between the ages of 12 and 17 use online social network sites (Lenhart and Madden, 2007). Additionally, almost half of these users check their account either once a day or several times a day. While the increase in the use of these sites has generated concerns among parents, school officials, and government officials about the potential risks posting personal information on these sites, it is evident they have a series of positive pedagogical implications (Lenhart and Madden, 2007). Currently, users utilize these sites to stay in touch with their friends, to make plans, make new friends, or flirt with somebody online (Lenhart and Madden, 2007). Extending this idea, these sites could be used to establish a series of academic connections or to foster cooperation and collaboration in the higher education classroom.

2.1.4 Social bookmarking

Social bookmarking sites allow users to store, describe, and share numerous web addresses with others. Users can explore bookmark collections of others by subscribing to their bookmark pages. If users are interested in a site they could tag it using few words to help others find it easily. Educators could use social bookmarking to facilitate collaborative information discovery (Alexander, 2006). They could create a social bookmarking page to save important pages about a topic. Students could also collaborate on group projects using book- marking

sites, sharing links, and uploading resources discovered, while educators could follow their students bookmark pages to gain insight on their research process and progress (Alexander, 2006).

2.2 Why Web 2.0 Technologies?

As previously mentioned, Web 2.0 concepts are not new. Listservs and other web-based communities designed to bring people with shared interests together have existed for quite some time (Alexander, 2006). While not designed specifically for educational purposes, Web 2.0 technologies have a number of affordances that can make them useful in teaching and learning environments and are rooted in strong pedagogical underpinnings of constructivism (Ferdig, 2007). The increasingly ubiquitous access, ease of use, functionality, and flexibility of emerging Web 2.0 technologies have made them much more appealing as instructional tools (Boulos, Maramba, and Wheeler, 2006; Chen, Cannon, Gabrio, Leifer, and Bailey, 2005). Moreover, Web 2.0 tools can support pedagogical approaches such as active learning, social learning, and student publication, by providing environments and technologies that promote and foster these interactions (Ferdig, 2007).

2.2.1 Digital natives and the changing nature of the web

Prensky (2001) refers to the next generation as 'digital natives' as individuals for whom digital technology has become ubiquitous. These digital natives are participating in social networks, social bookmarking, blogging, and other Web 2.0 activities on a regular basis (Pence, 2007). This, coupled with the changing nature of the web from primarily a source of information and content to a new tool for fostering the development of communities, creating information and knowledge, and sharing ideas, presents unique challenges and potential benefits for higher education (Maloney, 2007).

2.2.2 Supporting social and active learning

Many constructivist theorists posit that learning is a social process and that learning occurs through interactions and sharing information with each other (Bruner, 1996; Lave and Wenger, 1991; Vygotsky, 1978). Additionally, researchers have found that collaborative learning help students retain information better than students working individually (Johnson and Johnson, 1986). In addition to social learning, many theorists cite active participation as a major component of effective learning environments (Ferdig, 2007; Linn, 1991). While many traditional web applications focus on the delivery of content, Web 2.0 applications, such as blogs, wikis, social networks, and social book- marks, focus more on social connectivity. These Web 2.0 applications are driven by user contributions and interactions, unlike most of the sites of the Web 1.0 era. Thus, Web 2.0 applications provide venues for collaboration and sharing of information to support the networks necessary for social and active learning. Using Web 2.0 technologies such as wikis and social networks to supplement in-class instructions could create an interactive, collaborative learning experience for students in a media they are familiar with. This is especially true to college students who are considered "digital natives" of the world of the Internet and computers (Prensky, 2001).

2.2.3 Venues for student publication

Web 2.0 technologies provide numerous opportunities for learners to publish their work globally, which provide for a number of educational benefits. For example, Dixon and Black (1996) and Routman (1991) found that publication of student work resulted in increased motivation for many students. Riley and Roberts (2000), as well as Schofield and Davidson (2002), reported that, as a result of the publication of student work to the World Wide Web, students had more positive attitudes toward the subject matter and student achievement increased. Other studies have reported that student web publication promotes reflection

regarding individual growth and development and provides opportunities for students to visualize the purpose of their work much more clearly (Snyder, Lippincott, and Bower, 1998; Spitz, 1996; Willet-Smith, 1993). Additionally, learning environment that include student publication afford opportunities for students to examine problems in different ways, establish new connections, and ultimately develop a new entity that can be shared globally (Maloney, 2007).

While Web 2.0 technologies have many characteristics that support teaching and learning, research related to this area is limited. To date, the majorities of studies have been comparative in nature and have focused primarily on social networking tools, such as Facebook and MySpace and their uses in many extracurricular educational contexts (Pence, 2007). Additionally, while the use of Web 2.0 technologies is commonplace among "digital natives" (Prensky, 2001), it is important to explore perceptions of the teaching and learning implications of Web 2.0 applications, as well as actual use of Web 2.0 technologies to support learning of students. In this study, students' awareness of the potential of Web 2.0 technologies to supplement the classroom learning experience, as well as factors that influence the adoption of such technologies using the decomposed theory of planned behavior as the theoretical foundation (Taylor and Todd, 1995) were explored.

2.3 Effectiveness of Web 2.0 technologies to students' learning

Web 2.0 digital tools have the power to engage students in meaningful learning as well as social interactions (Atkinson and Swaggerty, 2011). According to Hartshone and Ajjan (2009), a lot of researchers indicate that Web 2.0 technologies are characterized by the ability to support active and social learning, provide opportunities and venues for student publication, as well as provide opportunities to provide effective and efficient feedback to learners. Additionally, the

implementation of web tools empowers students by providing opportunities to gain skills that are necessary for survival in the 21st century and, ultimately, the workforce (Parish J., 2012).

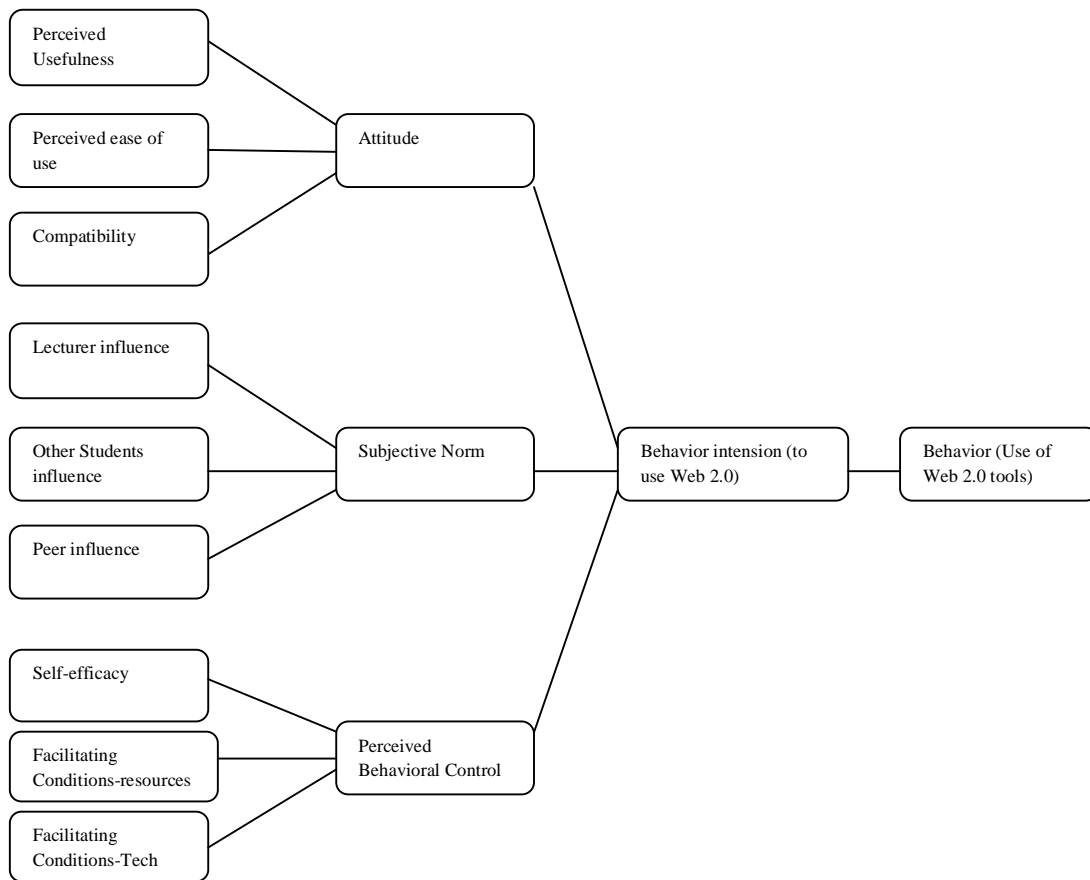
In a study of examining student decisions to adopt Web 2.0 technologies at a large University in the Southeastern United States, 423 students participated in a voluntary survey (Hartshone and Ajjan, 2009), as cited in Parish J. (2012). Students were administered a survey instrument using the DTPB as the framework. The survey consisted of 12 items and four sections. The survey items focused on comfort level of Web 2.0 tools, usage of Web 2.0 tools, and attitudes towards Web 2.0 tools. The researchers concluded that most students feel that integrating Web 2.0 technologies into the classroom learning environment can be affective at increasing satisfaction with the course, improve their learning, and increase student interaction with other students and faculty. The student role shifts from a passive to an active learner and are better able to create and retain knowledge (Hartshone and Ajjan, 2009), said Parish J.(2012).

2.4 Conceptual framework

This study employs the decomposed theory of planned behavior as the theoretical framework to understand students' intention to use Web 2.0. The decomposed theory of planned behavior originated from theory of planned behavior (TPB) that speculate that actions are determined by a combination of people's behavioral intentions and perceived behavioral control (Ajzen, 1991). Both the theory of planned behavior and the decomposed theory of planned behavior assert that behavior is a direct function of behavioral intention and both view behavioral intention as a function of attitude, subjective norms, and perceived behavioral control. In the decomposed theory of planned behavior attitude, subjective norms, and perceived behavioral controls are all decomposed into lower level belief constructs (Taylor and Todd, 1995). Using the decomposed model not only allows us to better understand the background relationship, but

also it allows us to uncover specific factors that impact the adoption or use of new technology (Taylor and Todd, 1995). Taylor and Todd (1995) showed that the decomposed model has better explanatory power over the theory of planned behavior. Therefore, this model was selected to explain the adoption intention and use of Web 2.0 technologies to supplement conventional methods of learning by students.

Fig. 1. Conceptual Framework for adoption of Web 2.0 technologies by using the DTPB.



2.4.1 Components of the Framework

2.4.1.1 Attitude

Attitude is defined as the degree to which the individual favors the behavior being examined

(Ajzen, 1991). This study focuses on three attitudinal components: perceived usefulness, perceived ease of use, and compatibility.

Perceived usefulness – This is the degree to which an individual believes that a technology would improve his/her work performance (Davis, 1989). The higher the perceived usefulness (or perceived advantage) the more likely it is for an individual to adopt the new technology (Rogers, 2003).

Ease of use - This represents the degree to which an innovation is easy to understand and operate (Rogers, 2003) or it is the degree to which a particular technology is free of effort (Davis, 1989). Technologies that are perceived to be less complex to use have higher possibility of acceptance and use by potential users. Ease of use has been found to be an important determinant in the technology adoption decision (Davis, 1989).

Compatibility – This is defined as the degree to which technology fits with the potential existing values and experiences (Rogers, 2003). According to Tornatzky and Klein (1982), an innovation is more likely to be adopted when it is compatible with the job responsibility and value system of an individual. As the ease of use, usefulness, and compatibility increase, the attitude towards using the technology is likely to become more positive.

2.4.1.2 Subjective norms

Subjective norms refer to the social pressures that make an individual perform a particular behavior (Ajzen, 1991). Different social groups might have different opinions regarding the adoption of a particular technology (Taylor and Todd, 1995). From this study, three groups were considered: Lecturers, peers and other students. While lecturers might feel that adopting Web 2.0 technology may improve student's learning, peers or friends might feel that it requires an undesired change in the current learning process. Other students or colleagues, on the other hand, might be more supportive since their level of comfort with Web 2.0 technologies is high

(Prensky, 2001).

2.4.1.3 Perceived behavioral control

Perceived behavioral control accounts for situations where individuals do not have complete control over their behavior and are made of two components (Ajzen, 1991). The first is self-efficacy reflecting the personal comfort with using technology (Bandura, 1982). The other component includes facilitating conditions (Triandis, 1979) reflecting the availability of resources such as time, money and other resources needed to use the technology. Greater self-efficacy to use technological applications is likely to lead to higher level of behavioral intentions and actual usage (Compeau and Higgins, 1995; Taylor and Todd, 1995). However, according to Taylor and Todd, (1995), the absence of facilitating conditions can negatively impact the intention and usage of technology.

2.5 Research hypotheses

2.5.1 Attitude

Past literature has shown that attitude influences behavioral intentions (Ajzen and Fishbein, 1980). Attitude in regard to the use of Web 2.0 technologies is defined as the students' desirability to use Web 2.0 to support their study. Attitude's positive relationship to behavioral intention has received a strong empirical support in previous research (Ajzen and Fishbein, 1980; Taylor and Todd, 1995). Therefore, it is expected that students' favorable attitude to use Web 2.0 tools positively influences their intention to use Web 2.0 technology.

Hypothesis 1. Attitude of students towards using Web 2.0 tools positively affects their behavioral intentions.

2.5.2 Subjective norms

Subjective norms are concerned with how an individual's behavior is influenced by the desire to

act as other important referents think we should act or as they act themselves (Taylor and Todd, 1995). Applied to students' use of Web 2.0 technology, subjective norms will reflect the students' perception of whether their behavior is encouraged and accepted within their circle of influence. A positive relationship between subjective norms and intention to use Web 2.0 to supplement conventional learning is hypothesized as:

Hypothesis 2: Subjective norms of students in relation to usage of Web 2.0 technologies positively affect behavioral intentions.

2.5.3 Perceived behavioral control

The individual's perception on how easy or difficult it is to carry out the behavior is referred to as perceived behavioral control (Ajzen, 1991). This is closely related to the individual's perception of control over carrying out a behavior. Past literature has demonstrated that perceived behavioral control is an important determinant of intention and use of technology (Taylor and Todd, 1995). Applied to Web 2.0 technologies, perceived behavioral control reflects the students' belief regarding the resources and self-confidence in their ability to perform the behavior. A positive relationship is hypothesized between perceived behavioral control and intention to use Web 2.0. Therefore,

Hypothesis 3. Perceived behavioral control of students in relation to usage of Web 2.0 technologies positively affects behavioral intentions.

2.5.4 Behavioral intention

Behavioral intention is concerned with the motivational factors when a subject intends to take a specific action (Ajzen, 1991). The theory of planned behavior (Ajzen, 1991) suggests that behavioral intention is the most important determinant factor in predicting the decision to take a specific action or not. Past studies have used behavioral intention to forecast specific behavior,

given the close relationship between intention and behavior (Ajzen, 1991). A positive relationship between intention and actual behavior when it comes to using Web 2.0 technologies to supplement in-class learning is hypothesized as:

Hypothesis 4: Behavioral intention to use Web 2.0 technologies positively affects behavior.

2.5.5 Decomposed behaviour

The initial set of hypotheses are based on TPB as mentioned earlier Taylor and Todd (1995) who recommended decomposing the three measures of attitude, subjective norms, and perceived behavioral control into multidimensional constructs to provide a better understanding of each behavior. Also, this has been recommended to provide higher explanatory power and better predictive validity (Taylor and Todd, 1995).

2.5.5.1 Perceived usefulness

Perceived usefulness is the degree to which the subject believes that the use a technology will enhance performance (Davis, 1989). Perceived usefulness of using Web 2.0 technologies is defined as the extent to which students believe that using Web 2.0 will enhance their effectiveness in the classroom. Past literature has found that perceived usefulness to influence behavioral intention through attitude (Davis, 1989; Taylor and Todd, 1995). Therefore,

Hypothesis 5a. Perceived usefulness positively affects attitudes towards usage of Web 2.0 technologies.

2.5.5.2 Perceived ease of use

Perceived ease of use has to do with the person's belief that the use of the new technology will be free of effort (Davis, 1989). Perceived ease of use of using Web 2.0 technologies is defined as the extent to which students believe that using Web 2.0 technologies would be free of effort. The effect of perceived ease of use has been found to impact intention to use through attitude

(Davis,1989; Taylor and Todd,1995). Thus,

Hypothesis 5b. Perceived ease of use positively affects attitudes towards usage of Web 2.0.

2.5.5.3 Compatibility

Compatibility has to do with the fit between the new technology with the individual's existing experiences and job responsibility (Rogers, 2003). Applied to Web 2.0 technologies, compatibility is defined as the extent to which students believe that using Web 2.0 technologies would be compatible with their study. The role of compatibility is mediated by attitude (Taylor and Todd, 1995). Hence,

Hypothesis 5c. Perceived compatibility positively affects attitudes towards usage of Web 2.0 technologies.

2.5.5.4 Referent groups

Given that expectations among different referent groups might differ, the literature recommends the decomposition of the referent groups into superiors, peers, and subordinates (Taylor and Todd, 1995). Students' intention to use Web 2.0 technologies could be impacted by several referent groups in their social circle such as lecturer, peer, and other students. Referent groups' impact on intention to use Web 2.0 is mediated by subjective norms (Taylor and Todd, 1995).

Therefore,

Hypothesis 6a. Lecturer influence to use Web 2.0 technology positively affects subject norms.

Hypothesis 6b. Peer influence to use Web 2.0 technology positively affects subject norms.

Hypothesis 6c. Other students' influence to use Web 2.0 technology positively affects subject norms.

2.5.5.5 Self-efficacy

Self-efficacy is defined as individual's perceived capabilities to perform a behavior. Previous

studies have found that higher self-efficacy is related to higher levels of behavioral intention and usage (Compeau and Higgins, 1995; Taylor and Todd, 1995). Applied to Web 2.0 technologies use, self-efficacy describes students' judgment of their own capabilities to use Web 2.0 technologies to support their conventional learning environment.

Hypothesis 7a. Self-efficacy of using Web 2.0 technologies positively affects perceived behavioral control.

2.5.5.6 Facilitating conditions

The absence of the required facilitating resources could present a barrier to usage and to the formation of intention (Taylor and Todd, 1995). In order to use Web 2.0 technologies, students members need to have facilitating condition available in terms of resources such as time, money and compatible technology. Thus,

Hypothesis 7b. Facilitating resource conditions of using Web 2.0 technologies positively affect perceived behavioral control.

Hypothesis 7c. Facilitating technology conditions of using Web 2.0 technologies positively affect perceived behavioral control.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The study methodology covered the following aspects; research design, operationalization of variables, location of the study, population and target population, sample and sampling process, instruments for collecting data, as well as procedure for collecting data.

3.1 Research Design

A research design is a procedural plan adopted by researchers to answer research questions validly, objectively, accurately and economically. According to Orodho (2003), a study research design is concerned with obtaining information by interviewing or administering a questionnaire to a sample of respondents. The research design that was used in this study was a descriptive survey case study design to explore factors affecting usage and adoption of web 2.0 technologies by students at School of computing and informatics, University of Nairobi.

3.2 Operationalization of Variables

Table 3.1 Operationalization of Variables

Variables/aspect of Conceptual framework	Indicator	Measurement Scale	Study Design	Tools of Analysis
Attitude	Positive attitude affects intention to use web 2.0 technology	Ordinal	Descriptive	Likert scale
a) Perceived usefulness	Positive perceived usefulness influences attitude to use	Ordinal	Descriptive	Likert scale
b) Perceived ease of use	Positive perceived ease of use influences	Ordinal	Descriptive	Likert scale

use	attitude to use			
c) Perceived compatibility	Positive perceived compatibility influences attitude to use	Ordinal	Descriptive	Likert scale
Subjective norms	Positive relationship between subjective norms affect behavioral intention	Ordinal	Descriptive	Likert scale
a) Referent groups	Lecturers influences to use web 2.0 technologies Peers/friends influences to use web 2.0 technologies Other students influence to use web 2.0 technologies	Ordinal	Descriptive	Likert scale
Behavioral control	Positive relationship between behavioral control and intention to use web 2.0 technologies	Ordinal	Descriptive	Likert scale
a) Self-efficacy	Student own judgement and capability	Ordinal	Descriptive	Likert scale
b) Facilitating Conditions	Availability of resources such as time, money and technology	Ordinal	Descriptive	Likert scale

3.3 Location of Study

This study was conducted at the School of computing and informatics, University of Nairobi. This school was selected because the researcher was one of the students.

3.4 Population of the Study

According to Mugenda and Mugenda (2003), population in research is a group of individuals, events, or objects in its totality where all units possess common and observable characteristics and which are subjected to examination, scrutiny or experiments with the aim of arriving at reliable conclusions for better decision making. The population for this study included all School of computing and informatics students who are currently a total of 539 (Source: SCI 2012/2013), from whom 120 students were sampled to fill the questionnaires. The accessible population therefore included all undergraduate and postgraduate, School of computing and informatics students. Table 3.1 below illustrates these facts.

Table 3.2 Population of the Study

Population	Frequency	% Frequency
Undergraduates	306	57
Masters	233	43
Total	539	100

(Source: SCI 2012/2013)

3.5 Sampling and Sampling Process

The sample method adopted was proportionate stratified sampling method. In this method, the population was divided into different subgroups or strata and then assigned 20 students as the sample. This method was preferred because students' population consists of different levels of study, age group and marital status. Kothari (2008) postulates that stratified sampling method is applied generally to obtain a representative sample. In using stratified sampling students will be

selected in such a way that the subgroups in the population are more or less replicated in the sample.

Table 3.3 Target Population and Sample size

Strata	Target Population	Sample size	Response Rate
1st Years	108	20	20
2nd Years	70	20	10
3rd Years	48	20	20
4th Years	80	20	15
MSC-CS	133	20	12
MSC-IS	100	20	8
Total	539	120	85

3.6 Data Collection Instrument and Procedure

This study collected both primary and secondary data relating to factors affecting usage of web 2.0 technologies by students. Primary data was collected by use of questionnaires as the survey instrument which was designed using the decomposed theory of planned behavior as its guiding framework. The survey items were adapted from previous studies (Baylor and Ritchie, 2002) and focused on items exploring comfort level with Web 2.0 technologies, actual usage of specific Web 2.0 technologies by students, and attitudes toward those specific Web 2.0 technologies.

The questionnaires contained open and closed ended questions and was divided into five sections, A, B, C, D and E. Section A focused on the profile of the respondents while the other sections consisted of a series of items using a five point Likert-scale (strongly agree to strongly disagree) to examine factors that influence students' intentions to utilize Web 2.0 technologies in their learning. Items focused on areas of actual usage, behavioral intention, attitude, ease of

use, perceived usefulness, compatibility, subjective norms, peer influence, lecturer influence, other students' influence, perceived behavioral control, self-efficacy, facilitating conditions, such as technology and resources. The questionnaires were dropped and picked from the respondents within a time period of two days. Secondary data was gathered from publications and other literatures relating to Web 2.0 Technologies. (See appendix)

3.8 Ethical Considerations

Data was obtained from the respondents at their consent and that of the institution. All the information obtained were kept private, treated with the confidentiality, and was used for academic purposes. Only the findings were published and not the raw data.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents the research findings that established factors affecting students' usage and adoption of Web 2.0 technologies. From the study sample size of 120 respondents, 85 respondents filled and returned their questionnaires, constituting 70.8% response rate. Data analysis was done through Statistical Package for Social Scientists (SPSS). Descriptive statistics was used to analyze the data. In the descriptive statistics, relative frequencies, percentages were used to analyze some questions. Given the multivariate context of the variables involved in the study, path analysis models were used to test the hypothesized relationships (Wright, 1921)

4.1 General Information

4.1.1 Reliability Analysis

Table 4.1: Reliability Analysis

Construct	Item	α value
Actual Behavior		0.82
AB1	I believe that I could communicate to others the consequences of using Web 2.0 technologies for learning.	
AB2	I would have no difficulty explaining why Web 2.0 technologies may or may not be beneficial	
Behavioral intention		0.851
INT1	I plan to use Web 2.0 technologies to study	
INT2	I intend to use Web 2.0 technologies within the next semester	
INT3	I will add Web 2.0 technologies to my class reading list.	
Attitude		0.96
ATT1	Web 2.0 is useful in my study	
ATT2	The advantage of using Web 2.0 outweighs the disadvantages of not using it	

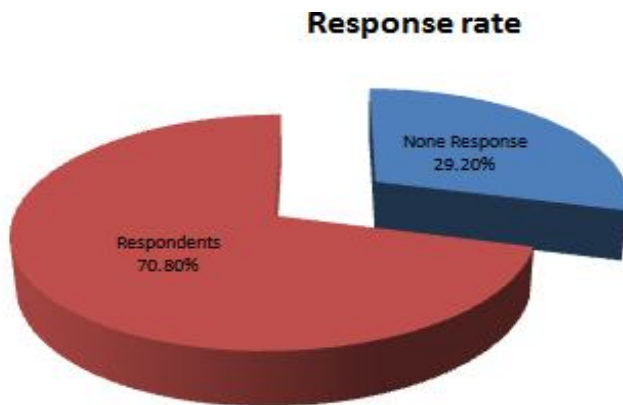
ATT3	Using Web 2.0 is a good idea	0.84
Ease of use		
EU1	I feel that using Web 2.0 will be easy	
EU2	I feel that using Web 2.0 will be easy to do my assignments	
Perceived usefulness		0.876
PU1	I feel that using Web 2.0 will help me learn more about my course	
PU2	I feel that using Web 2.0 will improve my satisfaction with the course	
PU3	I feel that using Web 2.0 will improve my grades	
Compatibility		0.85
C1	Using Web 2.0 technologies is compatible with my course.	
C2	Using Web 2.0 technologies fit well with my course.	
C3	Web 2.0 technologies are compatible with the computer I already use for my study.	
Subjective norms		0.74
SN1	My peers are using Web 2.0 technologies in their studies	
SN2	My lecturers confirm my ability and knowledge to use Web 2.0 technologies	
SN3	My peers think I will benefit from using Web 2.0 technologies in my study	
SN4	My lecturers thinks it is important I use Web 2.0 technologies in learning	
SN5	Other students think it is important that I use Web 2.0 technologies in doing assignments.	
Peers' influence		0.84
PI1	Friends who influence my behavior think that I should use Web 2.0 technologies to study	
Lecturers' influence		0.90
LI1	My lecturers feel that I should use Web 2.0 technologies while studying.	
Other students' influence		0.93
OSI1	Other students think that I should use Web 2.0 technologies all the time.	
Perceived behavioral control		0.67
PBC1	Using Web 2.0 technologies is entirely within my control	

PBC2	I have the knowledge and ability to use Web 2.0 technologies	
Facilitating conditions technology		
FC1	I can use Web 2.0 technologies using any computer connected to the Internet	0.61
Facilitating conditions-resources		
FC2	I have adequate resources to use Web 2.0 technologies.	0.65
Self-efficacy		
SE1	I am comfortable using Web 2.0 technologies	0.73
SE2	I could easily use Web 2.0 technologies on my own	
SE3	I have adequate knowledge to use Web 2.0 technologies	

Reliability of the questionnaire was evaluated through Cronbach's Alpha which measures the internal consistency. The Alpha measures internal consistency by establishing if certain item measures the same construct. Nunnally (1978) established the Alpha value threshold at 0.6 which the study benchmarked against. Cronbach Alpha was established for every objective in order to determine if each scale (objective) would produce consistent results should the research be done later on. The questionnaire was divided into five sections but only four sections were based on the objectives of the study. The factors that effects usage and adoption of Web 2.0 technologies were categorized as ease of use, perceived usefulness, compatibility which influence attitude ($\alpha=0.96$); peer influence, lecturer influence, other students influence which influence subjective norms ($\alpha = 0.74$) and finally self-efficacy, facilitating conditions which influence perceived behavioural condition ($\alpha=0.67$). Attitude, subjective norms and perceived behavioural control further effects behaviour intention ($\alpha =0.851$), which further effects actual usage of the technology ($\alpha=0.82$). This illustrates that all the items of the variables were reliable as their reliability values exceeded the prescribed threshold of 0.6. (See table 4.1)

4.1.2 Response Rate

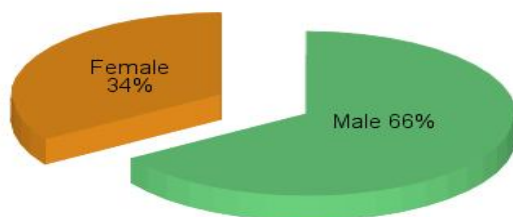
Fig. 4.1: Response rate



The study was conducted on 120 students who were served with questionnaires. Out of 120 targeted respondents, 85 filled-in and returned the questionnaires which make a response rate of 70.8%, Mugenda and Mugenda (2004) who indicated that a response rate of between 40 to 80% of the total sample size can be generalized to represent the opinion of the entire population. The return rate was considered adequate in providing valid and reliable presentation of the targeted population. This high response rate can be attributed to the fact that the researcher administered the questionnaires personally and so was available to clarify queries as well as prompt respondents to fill the questions. Fig. 4.2 illustrates these facts.

4.1.3 Gender of the respondents

Fig. 4.2 Gender distribution of the respondent



The study sought to determine, the gender composition of respondents. From the findings as indicated in fig 4.2 above, most respondents were male accounting to 66 % of the respondents while 34% were female.

4.1.4 Age of the respondent

Table 4.1 Age Distribution of the Respondents

Age Distribution of Respondents				
Years	Frequency	Percent	Valid Percent	Cumulative Percent
19-21	32	37.6	37.6	37.6
22-24	35	41.2	41.2	78.8
25-27	12	14.1	14.1	92.9
28-30	3	3.5	3.5	96.5
Above 30	3	3.5	3.5	100.0
Total	85	100.0	100.0	

The findings further established the respondent’s age distribution. From the findings as indicated in Table 4.2 majority of the respondents were between 22-24 years (41.2%), followed by those who indicated that they were 19-21 years accounting for 37.6%, those between 25-27 accounting for 14.1%, the least were those between 28-30 years represented and those above 30 years. The findings indicate that most of the students who were comparatively of similar age bracket.

4.1.5 Level of Study

Table 4.2 Respondents’ level of study

Level of Study				
	Frequency	Percent	Valid Percent	Cumulative Percent

Undergraduate	60	70.6	70.6	70.6
Postgraduate	25	29.4	29.4	100.0
Total	85	100.0	100.0	

Table 4.2 above indicates that majority of respondents were undergraduate accounting for 70.6% while 29.4% constituted masters' students.

4.1.6 Year of Study

Table 4.3 Year of Study

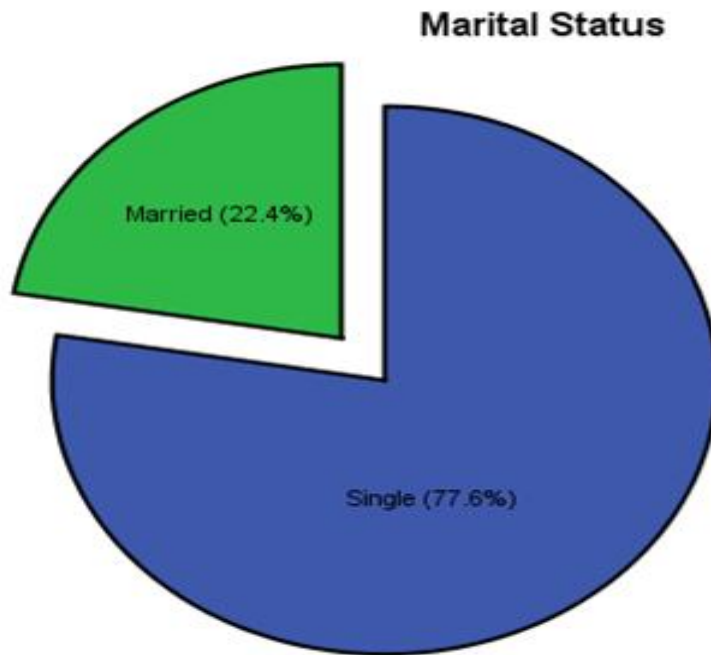
Year of Study					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First	19	22.4	22.6	22.6
	Second	10	11.8	11.9	34.5
	Third	20	23.5	23.8	58.3
	Fourth	15	17.4	17.9	77.2
	Masters	20	23.5	23.8	100.0
	Total	84	98.8	100.0	
Missing	System	1	1.4		
Total		85	100.0		

The study sought to determine how long the respondents have studied at School of informatics at University of Nairobi. As was indicated earlier in table 4.3 majority of respondents were undergraduate. From the findings as indicated in Figure 4.5 above, majority of students were third years (23.8%) and Masters (23.8), followed closely by first years (22.6%), 17.9% were fourth years while the least respondents according to year of study were second years (11.9%).

4.1.7 Marital status of the respondents

From fig 4.3 below shows that majority of respondents were not married constituting 77.7% while the married comprised 22.4% of the total respondents.

Fig 4.3 Marital Status of the respondents



4.2 Data Analysis

4.2.1 Perceptions of the educational benefits of using Web 2.0 Technology

The students felt that the use of different Web 2.0 technologies to supplement in-class learning methods could provide them with numerous benefits (Table 4.1). In terms of Web 2.0 technologies that would improve students' learning, 54% of the students felt that the use of social networking would, 27% felt that about blogs, 12% felt that about wikis, and only 7% felt that about social bookmarking. About 46% felt that the use of blogs would increase the interaction between teachers and students, 36% felt that the same benefits would be attained from using social networking, and 7% felt that about the use of wikis and social bookmark. In terms of increasing student and other student interaction, 43% felt that about social networking,

32% felt that about blogs, 20% felt that about wikis and only 5% felt the same about social bookmarks. In terms of improving students' satisfaction with the course, 38% felt that the use of social networking would, 29% felt the use of blogs would, 22% felt the use of wikis would, and only 11% felt the use of social bookmarking would. About 38% of the respondents felt that the use of blogs would improve students writing skills, while 29% felt the use of wikis would help with that. In terms of integrating the technologies with the course content 33% felt that the use of blogs could be easily integrated, 30% felt that social networking could be easily integrated, 29% felt that about social bookmarking, and only 8% felt that wikis would be easy to integrate.

Table 4.4: Student’ perceptions of the educational benefits of Web 2.0 Technologies

Web 2.0 Technologies	Improve student learning	Increase student-lecturer interaction	Increase student-student interaction	Improve student satisfaction with course	Improve student writing skills	Easy to integrate
Blogs	27%	46%	32%	29%	38%	33%
Wikis	12%	7%	20%	22%	29%	8%
Social networks	54%	36%	43%	38%	21%	30%
Social bookmarks	7%	7%	5%	11%	12%	29%

4.2.2 Student use of Web 2.0 Technology

Although majority of students felt that Web 2.0 technologies provide many benefits, a few still chose not to use them (Table 4.5). In fact 39% of the students did not use social bookmarking and did not plan to use in the near future, and only 14% use it occasionally to supplement their learning. Also, 40% don't use social bookmarking but plan to use it. Similarly, 35% don't use and don't plan to use wikis, and only 16% use it occasionally. Finally about 51% frequently use social networking, 43% use it occasionally and only 4 % don't use and don't plan to use it.

Table 4.5 : Student use of Web 2.0 Technologies

	Don't use and don't plan to use	Don't use but plan to use	Use occasionally	Frequently use
Blogs	22%	20%	28%	32%
Wikis	35%	32%	15%	11%
Social networking	4%	8%	43%	51%
Social bookmarking	39%	40%	14%	6%

4.2.3 The Results

The results highlighted that quite a good proportion of the students felt that the selected Web 2.0 technologies would provide them with many benefits, but still a few chose not to use them. This might be partially explained by their level of comfort with such technologies. Most of respondents have never used some of these Web 2.0 technologies. In fact, 39% have never used social bookmaking and 35% have never used wikis. On the other hand, students felt more comfortable using blogs and social networking, while 22% have never used blogs and only 4% have never used social networking. 32% claim that they are learning and 11% felt competent using wikis. The lack of experience with some of these Web 2.0 technologies examined in this study could drive students to avoid their adoption, although they realize that this adoption would provide them with many important benefits. In order to better understand factors leading to Web 2.0 technologies adoption and use, the decomposed theory of planned behavior was applied.

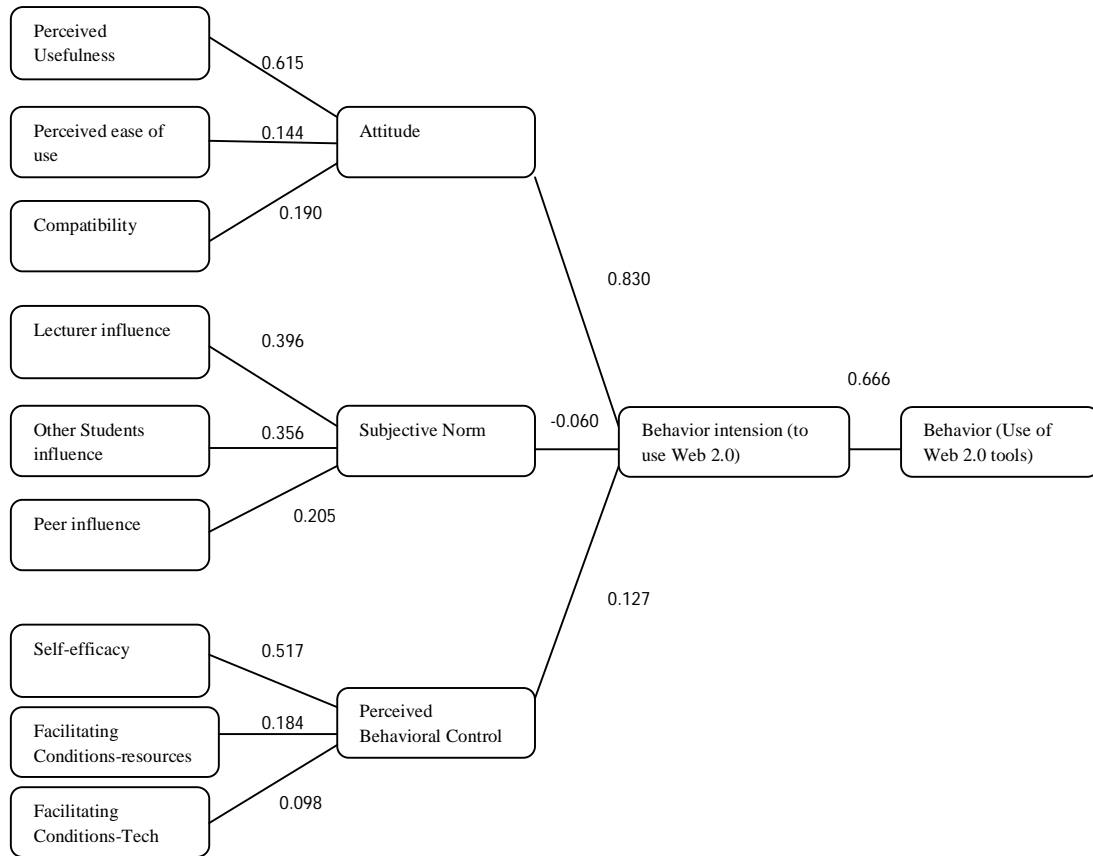
4.2.4 Path Analysis and Research Hypothesis

The decomposed theory of planned behavior is useful for explaining much of the variance in the use of Web 2.0 technologies by students. Additionally, most paths in the model were statistically significant. Using the results of the path analysis, the research hypotheses findings were presented (see Fig. 4.4).

Table 4.6: Path Analysis of factors that influence the adoption of web 2.0

Equation	R ² (adjusted R ²)	Beta (t-scores)
Behavior (B)	0.442 (0.437)	
B=I		
I		0.666 (9.991)
Behavioral intent (I)		
I= A + SN + PBC	0.760 (0.754)	
A		0.830 (12.334)
SN		-0.060 (- 0.952)
PBC		0.128 (2.218)
Attitude (A)		
A = PU + PEOU + C	0.806 (0.801)	
PU		0.615 (7.604)
PEOU		0.144 (2.125)
C		0.190 (2.546)
Subjective norm (SN)		
SN = OSI + PI + LI	0.641 (0.632)	
OSI		0.356 (5.235)
PI		0.205 (2.344)
LI		0.396 (5.114)
Perceived behavioral control (PBC)		
PBC = SE + FC-R + FC-T	0.534 (0.522)	
SE		0.518 (6.125)
FC-R		0.185 (1.321)
FC-T		0.098 (0.706)

Fig. 4.4: Path analysis of factors that influence Students adoption of Web 2.0 technologies for their study.



4.2.4.1 Behavioral intention

Regression results confirmed each of the three factors, attitude, behavioral intention, and subjective norm, explains a significant variance (75.4%) in behavioral intention (adjusted R^2). Research hypothesis 1 of this study was that the attitudes of users towards Web 2.0 positively affect behavioral intentions. Path analysis confirmed that attitude ($\beta = 0.830$, $t = 12.334$) was the only determinant that had a very significant effect on behavioral intention. Therefore, this study confirmed research hypothesis 1. Research hypothesis 2 states that subjective norms of users in relation to usage of Web 2.0 positively affect behavior. Examining path analysis results, the subjective norm ($\beta = -0.060$, $t = -0.952$) had no significant effect on the behavioral intention. Thus, this study fails to confirm research hypothesis 2.

Finally, research hypothesis 3 states that perceived behavioral control of users in relation to usage of Web 2.0 technologies positively affects behavioral intentions. Path analysis results indicate the perceived behavioral control ($\beta = 0.128$, $t = 2.218$) had a significant effect on the behavioral intention. Hence, research hypothesis 3 is confirmed by the results of this study.

4.2.4.2 Behavior

Research hypothesis 4 states that behavioral intention to use Web 2.0 positively affects behavior. Examining the path analysis results, behavioral intention ($\beta = 0.666$, $t = 9.991$) has a very significant effect on actual behavior and the behavior equation addresses 43.7% of the variance (adjusted R^2). Therefore, this study confirmed research hypothesis 4.

4.2.4.3 Attitude

Regression results confirmed each of the three factors, perceived usefulness, perceived ease of use, and perceived compatibility, explain a significant variance of 80.1% (adjusted R^2) in attitude. Research hypothesis 5a states that perceived usefulness positively affects attitudes towards usage of Web 2.0. Examining the path analysis results, perceived usefulness ($\beta = 0.614$, $t = 7.604$) of Web 2.0 technologies had a very significant effect on attitudes toward Web 2.0 technologies. Thus, the results of this study confirmed research hypothesis 5a. Research hypothesis 5b states the perceived ease of use positively affects attitudes towards usage of Web 2.0. Additionally, research hypothesis 5c states the perceived compatibility positively affects attitudes towards usage of Web 2.0. Path analysis results indicate that these two determinants of attitudes, perceived ease of use ($\beta = 0.144$, $t = 2.125$) and compatibility ($\beta = 0.190$, $t = 2.546$) of Web 2.0 technologies with existing technologies both had significant effects on attitudes. Thus, research hypotheses 5b and 5c were both confirmed by the results of this study. Attitudes ($\beta = 0.830$, $t = 12.334$), in turn, had the greatest effect on behavioral intention.

4.2.5 Subjective norm

Regression results confirmed each of the three factors: lecturer influence, other students' influence, and peer influence, explain a significant variance of 63.2%, (adjusted R^2) in the subjective norm. Research hypothesis 6a states Lecturer influence to use Web 2.0 technology positively affects subjective norms. Research hypothesis 6b states that peer influence to use Web 2.0 technology positively affects subjective norms. Finally, research hypothesis 6c states that other students' influence to use Web 2.0 technology positively affects subjective norms. Examining the path analysis results for each of the determinants, Lecturer influence ($\beta = 0.396$, $t = 5.114$) and other students' influence ($\beta = 0.356$, $t = 5.235$) both had very significant effects on subjective norms. Path analysis results for the third individual determinant, peer influence ($\beta = 0.205$, $t = 2.334$), indicate that it had a significant effect on subjective norms. Thus, research hypotheses 6a, 6b, and 6c are all confirmed by the results of this study.

4.2.6 Perceived behavioral control

Regression results confirmed each of the three factors, facilitating conditions—resources, facilitating conditions—technology and self-efficacy, explains a significant variance (52.2%) in perceived behavioral control (adjusted R^2). Research hypothesis 7a states that self-efficacy of using Web 2.0 technologies positively affects perceived behavioral control. Additionally, research hypothesis 7b states facilitating conditions of using Web 2.0 technologies positively affect perceived behavioral control. Examining the path analysis results, two of the three individual determinants, facilitating conditions—resources ($\beta = 0.185$, $t = 1.321$) and facilitating conditions—technology ($\beta = 0.098$, $t = 0.706$) had no significant effects on the perceived behavioral control. Thus, the results of this study fail to confirm research hypotheses 7b and 7c. However, the third determinant, self-efficacy ($\beta = 0.518$, $t = 6.125$), did have a significant effect on perceived behavioral control. So, the results of this study confirmed research hypothesis 7a.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

5.0 Summary

The purpose of this study was to assess students' awareness of the benefits of Web 2.0 to supplement in-class learning and to assess students' decisions to adopt these tools using the DTPB model. The following research questions were explored:

Research Question 1: Are students aware of the benefits of using Web 2.0 technologies to supplement the traditional classroom methods?

Research Question 2: What factors best predict student's decision to adopt Web 2.0 technologies to supplement the conventional classroom methods?

5.1.1 Research Question 1

The first question examined if, and to what extent, students are aware of educational benefits of Web 2.0 technologies. The results are interpreted in the following manner: Many respondents acknowledged educational benefits of Web 2.0 applications in higher education. More specifically, blogs and social networking were viewed as the most useful Web 2.0 technologies in terms of improving student learning (Social networking-54%, blogs-27%), increasing student-lecturer interactions (blogs-46%, social networking-36%), improving student-student interaction (social networking-43%, blogs-32%), improving student writing (blogs-38%, social networking-21%) and ease of integration (blogs-33%, social network-30%). In terms of increasing student-student interactions, social networks were viewed as being the most beneficial (43%). Social networks were also viewed as useful tools for improving student satisfaction in courses (32%). For the most part, wikis were viewed as not having significant potential to improve student learning (12%), increasing student-lecturer (7%) and student-student interactions (20%), improving student satisfaction with courses (22%), improving student writing (29%), and ease of integration (8%).

While these results provided some initial encouragement, they were quickly overshadowed by an examination of actual use of Web 2.0 technologies by students in their learning. The majority of students do not currently use and have no plans to use either wikis (35%) or social bookmarks (39%). Additionally, a greater percentage of respondents do not currently use, but plan to use, wikis (32%), and social bookmarks (40%). But on the other hand a greater percentages of respondents currently use blogs (32%) and social networks (51%). Additional factors that influence the limited use of Web 2.0 applications were explored in Research Question 2.

5.1.2 Research Question 2

The second question examined which factors best predict the adoption of Web 2.0 technologies by students for learning purposes. Examining the path analysis results, this study provides evidence that attitudes and perceived behavioral control have fairly strong positive influences on behavioral intention to use Web 2.0 technology, while subjective norm did not influence behavioral intention. This insignificant effect might be explained, in part, by the high degree of independence student have when studying (Barnett et al., 2004). As would be expected from the decomposed theory of planned behavior, behavioral intention is a strong determinant of actual behavior or usage of Web 2.0. The results also show that ease of use, usefulness, and compatibility of Web 2.0 are key determinants of subject's attitude to use Web 2.0 technology. Additionally, the influence of three groups: Lecturers, peers and other students have positive influence on the student subjective norms. In other words, these three groups are key determinants of the social influence that determine the use of Web 2.0 technologies. Only self-efficacy was found to influence the perception of behavioral control. On the other hand, facilitating technology and resource conditions do not have influence on the perception of behavioral control toward the intention and usage of Web 2.0 technologies. These results indicate that personal involvement is an important mechanism to influence Web 2.0 usage, while facility conditions in terms of resources and technology are not as important in determining student usage of Web 2.0 technologies partly because they are provided.

5.2 Recommendations for future research

The goal of this study was to assess students' awareness of the benefits of Web 2.0 to supplement in-class learning and assess their decisions to adopt these tools using the decomposed theory of planned behavior. While the initial results related to students' awareness of educational benefits of Web 2.0 technologies were encouraging at times, they also lead to new questions and concerns. The results of this study provide a foundation for future research examining more specific factors that promote and inhibit students' use of Web 2.0 technologies, as well as methods of fostering support for students' use of Web 2.0 technologies. Based on the findings of this study, as well as the discrepancy of empirical studies related to the use of Web 2.0 technologies in higher education, the following are suggestions for future research:-

While this study examined students' awareness of benefits using Web 2.0 technologies, there was no examination of factors in place to support staffs integration of technology into their courses. For example, did students participate in any technology-based course orientation on admission to the school; do schools provide technological support for open source technologies, of which many Web 2.0 technologies are; is the use of Web 2.0 technologies encouraged by student's mentors? As a result, it would be beneficial to further study factors in place to support the integration of technology into courses, as well as the effectiveness of these support factors.

Another interesting future research idea would be to apply the same decomposed theory of planned behavior to understand and predict lecturers' intentions and behaviors to use Web 2.0 technologies to supplement their in-class teaching. After an analysis of the lecturers' data, it could then be compared with students' expectations from Web 2.0 use in an attempt to understand whether there is a gap in understanding among the students and the staff and whether or not the same factors influence students and staff use.

5.3 Limitations of this Study

One limitation of this study was that all students were from the same school of one university. Future studies could collect data from multiple schools and colleges of the same university, and

likewise, different universities. An interesting extension to this study would be to compare the use of Web 2.0 technologies in research-oriented universities and teaching-oriented universities and colleges, to examine whether differences in factors predicting Web 2.0 technologies intention and usage exist.

Another limitation is the general focus of this study on Web 2.0 technologies. There are several types of Web 2.0 technologies and their use and impact on learning could differ. In order to elevate this confounding effect, there was a focus on only a few Web 2.0 technologies (e.g. wikis, blogs, social networks, and social bookmark). Still, the effect of each of these on the learning environment could vary. Future studies could control for the type of Web 2.0 technologies and examine differences in their impact on the learning environment and students achievements.

5.4 Conclusion

The use of Web 2.0 technologies offer many powerful information sharing and collaboration opportunities for learners and learning. In this study students awareness and perceptions on the pedagogical benefits of some of the Web 2.0 technologies were looked into. The findings indicated that indeed they find the technologies having several benefits with respect to learning, interaction, writing skills and satisfaction with their courses. Also factors that influence students' perceptions of several Web 2.0 technologies in learning, as well as actual use of these Web 2.0 technologies were explored using DTPB. The result indicated that attitude and behavioral intention are the main determinants of the use of Web 2.0 technologies. Although these achievements were found, future research is still necessary in order to identify the most effective methods of utilizing Web 2.0 technologies to improve teaching and learning productivity; and to better support active, social, and engaging learning environments.

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APPENDICES