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FACULTY PERCEPTIONS AND USE OF WEB 2.0 TOOLS IN
SAUDI ARABIAN HIGHER EDUCATION

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
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ABSTRACT

This study investigated factors that predict Saudi Arabian faculty members' intentions to adopt and use Web 2.0 tools and to assess faculty's awareness of the educational benefits of Web 2.0 tools to supplement classroom instructions in higher education. One hundred and three faculty members (34 male and 69 female) from a large university in the Western region of Saudi Arabia participated in the web survey. The framework and model for explaining and predicting the contributing factors towards the decision to adopt and use of Web 2.0 tools was the Decomposed Theory of Planned Behavior (DTPB). The partial least squares structural equation modeling (PLS-SEM) approach was utilized to analyze data collected from the web survey. Results indicate that positive attitudes and perceived usefulness are significant predictors of Saudi Arabian faculty members' intentions to use Web 2.0 tools. Moreover, findings indicate that Saudi Arabian faculty members intend to use Web 2.0 tools such as blogs, wikis, and social networking in their future classrooms to improve students' learning, student-student interaction, student-faculty interaction, and students' writing ability. Research implications for administrators and higher educational institutions indicate that professional development programs could be designed based on the significant predictors in the DTPB to support a successful integration of Web 2.0 tools in higher education.

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TABLE OF CONTENTS

LIST OF FIGURES	x
LIST OF TABLES	xi
CHAPTER 1: INTRODUCTION	1
1.1 Higher Education in Saudi Arabia	2
1.2 Statement of the Problem.....	4
1.3 Purpose of the Study	5
1.4 Significance of the Study.....	5
1.5 Research Questions.....	6
1.6 Research Hypotheses	7
1.7 Definition of Terms	9
1.8 Summary.....	10
CHAPTER 2: LITERATURE REVIEW	12
2.1 Web 2.0.....	14
2.2 The Educational Theory	16
2.3 Educational Affordance of Web 2.0 Tools	19
2.4 Issues and Barriers Affecting Web 2.0 Tools Integration.....	21
2.5 Web 2.0 Tools Uses in Education.....	25
2.5.1 Blogs	25
2.5.2 Wikis.....	27
2.5.3 Social networking	29
2.5.4 Instant messaging.....	31
2.5.5 Audio/Video conferencing.....	35

2.5.6	Media sharing.....	36
2.5.7	Content collaboration.....	37
2.6	Higher Education in the Kingdom of Saudi Arabia.....	39
2.7	The Use of Web 2.0 Tools in Saudi Arabian Higher Educational Institutions.....	42
2.8	The Decomposed Theory of Planned Behavior.....	44
2.9	Summary.....	47
CHAPTER 3: METHODOLOGY		49
3.1	Introduction	49
3.2	Research Design	49
3.3	Research Sampling	50
3.4	Instrumentation.....	52
3.5	Data Collection.....	57
3.6	Data Analysis.....	58
3.6.1.	Descriptive Analysis	58
3.6.2.	The PLS Path Model.....	59
3.7	Summary.....	65
CHAPTER 4: RESULTS.....		66
4.1	Introduction	66
4.2	Research Questions.....	66
4.3	Research Hypotheses.....	66
4.4	Descriptive Statistics	68
4.4.1	Participants.....	68
4.4.2	Faculty Use and Perceptions of Web 2.0 Tools.....	70
4.5	Factors Influencing Saudi Arabian Faculty’s Intentions to Use Web 2.0 Tools.....	82
4.5.1	Measurement Model Assessment.....	83

4.5.2	Structural Model Assessment.....	89
4.6	Summary.....	94
CHAPTER 5: DISCUSSION, IMPLICATIONS, RECOMMENDATIONS.....		96
5.1	Discussion of Findings	96
5.1.1.	Saudi Faculty Perceptions of Benefits and Use of Web 2.0 Tools	96
5.1.2.	Factors Predicting Saudi Faculty Members’ Intentions to use Web 2.0 Tools.....	97
5.2.	Implications for Practice.....	99
5.3.	Limitations.....	102
5.4.	Recommendations for Future Research.....	102
APPENDIX A: THE SURVEY		104
APPENDIX B: IRB APPROVAL LETTER		111
APPENDIX C: EMAIL INVETATION FOR SURVEY PARTICIPATION.....		113
REFERENCES		115

LIST OF FIGURES

Figure 1. Faculty adoption of Web 2.0 tools based on the Decomposed Theory of Planned Behavior.....	45
Figure 2. The Reflective Measurement Model for the PLS Path Model	61
Figure 3. Faculty Perceptions of Ease of Use of Web 2.0 Compared to their Expertise and Usage.....	77
Figure 4. Faculty Perceptions of Assigning Web 2.0 Tools to Demonstrate Knowledge	79
Figure 5. Saudi Arabian Faculty Intentions to Use Web 2.0 Tools in Future Classrooms	80
Figure 6. The PLS Path Model Results.....	91

LIST OF TABLES

Table 1. The Constructs and their Corresponding Survey Items	54
Table 2. Web 2.0 Tools Included in the Survey	57
Table 3. Profile of Respondents.....	69
Table 4. Total Number of Saudi Arabian Faculty at the University ("Higher education statistics," 2017).....	70
Table 5. Saudi Arabian Faculty Perceptions of the Educational Benefits of Web 2.0 Tools	72
Table 6. Measures of Central Tendency for Saudi Arabian Faculty Use of Web 2.0	74
Table 7. Saudi Arabian Faculty Use of Web 2.0 Tools	75
Table 8. Saudi Arabian Faculty Level of Comfort with Web 2.0 Tools.....	76
Table 9. Most Frequently Used or Might Use Web 2.0 Tools by Saudi Arabian Faculty	82
Table 10. Measurement Model Results	84
Table 11. Heterotrait-Monotrait Ratio (HTMT) Results	85
Table 12. Fornell-Larcker Criterion Results.....	86
Table 13. Cross-Loadings Results	87
Table 14. Hypotheses Test Results	92

CHAPTER 1: INTRODUCTION

As with its counterpart countries around the world, the Kingdom of Saudi Arabia is aiming to modernize its educational system. The emergence of information and instructional technologies has brought change to the academic environment and influenced the methods of teaching and learning in the information age (Collins & Halverson, 2010). Students are engaging in different ways of communication and completing tasks through their mobile devices, social networking sites, and cloud computing that allow them to engage in lifelong and flexible learning and enable them to be self-directed learners (Ajjan & Hartshorne, 2008; Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012). Further, the growing demand for higher education in Saudi Arabia has pushed higher educational institutions to take advantage of the technological innovations available in order to meet the growing needs and demands. Recently, the inclusion of Web 2.0 tools has emerged as the most promising tools for revamping public education since these tools are familiar and being used by students and instructors outside the classrooms (Seo, 2013). Therefore, technology integration is becoming an essential part of the Saudi Ministry of Education plans. The Ministry of Education has allocated major resources (labor, time, and money) to insure successful implementation of these technologies in the educational system (Khawaji, 2016). However, the availability of these technologies does not necessarily guarantee the full adoption and use of these tools among faculty members and students (Alfahad, 2012; Buchanan, Sainter, & Saunders, 2013; John, 2015; Keengwe, Kidd, & Kyei-Blankson, 2009; Mason, 2016). There are many factors that can influence or hinder the adoption of using such technologies in teaching and learning. These factors may include: awareness of the usefulness of the

technology, experience and skills using the technology, superior and peer influence, self-efficacy, and institutional support (Ajzen, 1991; Al-Asmari & Khan, 2014; Al-Hojailan, 2013; Reid, 2014).

Web 2.0 tools are web-based applications that allow its users to interact, communicate, create, and share information and content (Burhanna, Seeholzer, & Salem, 2009; Hartshorne & Ajjan, 2009). Many Web 2.0 tools have found their way to the educational systems and are being used for teaching and learning (Anderson, 2012). For example, blogs, wikis, content collaboration tools, media sharing, and social networking sites all are used by students and instructors to collaborate, communicate, create, and share information (Al-Dheleai & Tasir, 2017; Andujar, 2016; Brodahl & Hansen, 2014; Buzzetto-More, 2014; Erturk, 2016). The features of Web 2.0 tools complement the constructive philosophy of teaching and learning in which these tools allow learners to create, collaborate, and share knowledge beyond classroom walls (Seo, 2013). However, as Web 2.0 tools have the opportunity to change education, many institutions still wonder how to integrate these tools into the classroom. Understanding faculty perceptions and use of Web 2.0 tools could help gain better vision on how to facilitate the utilization of Web 2.0 tools in their classrooms.

1.1 Higher Education in Saudi Arabia

Over the last decade, higher education in Saudi Arabia has gone under significant improvements. According to the Saudi Arabian Ministry of Education website, higher education has expanded to include 38 public universities and 30 private colleges and universities distributed in all the regions of Saudi Arabia. Almost all of these colleges and universities have separated campuses for male and female. Saudi Arabian universities

offer Bachelor's, Master's, PhD, and fellowship degrees. All courses are taught in Arabic language except in the technological, science, and medical fields where English is mostly used. Saudi Arabian education is free for all Saudi citizen students who enroll in the public colleges and universities. According to the latest published statistics on higher education by the Saudi Arabian Ministry of Education, the number of students who were enrolled in the year of 2016 – 2017 was 1,680,913 students, and the number of faculty members who were teaching in the same year was 83,884; out of those, 49,760 were of Saudi nationality ("Higher education statistics," 2017).

The Saudi Ministry of Education has realized that in order to accommodate the growing demands on higher education programs in the country, higher educational institutions need to revamp their teaching practices (Al-Khalifa, 2010; Khawaji, 2016). An important goal of the strategic plan for the Ministry of Education is ensuring a successful implementation of technology integration in higher educational institutions in the country. The Saudi Arabian commitment to integrating educational technologies includes the use of Web 2.0 tools. These tools are beginning to be integrated into the Saudi Arabian educational system (Aifan, 2015; Khawaji, 2016). However, based on prior literature in other countries (Ajjan & Hartshorne, 2008; Buchanan et al., 2013; Soomro, Zai, & Jafri, 2015), a crucial part of successful implementation is the faculty members' perceptions of such technology in their teaching practices. There is a gap in the literature on what influences faculty members' to adopt Web 2.0 tools in Saudi Arabian higher educational institutions. Therefore, the purpose of this study is to investigate faculty perceptions and use of Web 2.0 tools in higher education in the Kingdom of Saudi Arabia.

1.2 Statement of the Problem

The leaders of Saudi Arabia have spared no expense when it comes to improving education (Al-Hojailan, 2013). The Ministry of Education in Saudi Arabia is pushing for more educational technology integration in order to meet the demands of the growing population in higher education programs as well as the demands of preparing individuals for the workforce with 21st century skills. With the emergence of technology in education, such as Web 2.0 tools, interacting with the Internet has become an important component of everyday life. The Internet is providing its users with enormous amount of resources and information, which has played a significant role in the learning process. Web 2.0 tools are an integral part of the educational technologies that are being used in some of the higher educational institutions around the globe. Therefore, the Saudi Arabian Ministry of Education is encouraging colleges and universities to use and integrate Web 2.0 tools to enhance the teaching and learning experiences. Nevertheless, the decision of adopting such tools and technologies is at most in the hands of faculty members. Although, faculty members are already using some Web 2.0 tools outside of the classrooms for communicating and building relationships with others, little research have investigated faculty members' integration and use of educational technology, especially Web 2.0 tools, in the Saudi Arabian higher education system (Al-Hojailan, 2013; Khawaji, 2016). Studies that focus on the use and integration of Web 2.0 tools are important as higher educational institutions move forward in the information age and incorporate technology to support learning. Thus, this study aims to enrich Saudi educational literature related to technology integration; especially Web 2.0 tools and help administrators to better understand factors that influence faculty decision to adopt Web

2.0 tools in their classrooms. This study will investigate Saudi Arabian faculty members' perceptions and use of Web 2.0 tools in teaching and learning in Saudi Arabian higher educational institutions.

1.3 Purpose of the Study

The purpose of this quantitative study is to investigate the perceptions and use of Saudi Arabian faculty members of Web 2.0 tools in their classrooms. It is designed to understand factors that influence the decision of Saudi Arabian faculty to adopt and use Web 2.0 tools in teaching and learning. Additionally, this study explores the most used Web 2.0 tools by Saudi Arabian faculty members, their experience level with different categories of Web 2.0 tools, and their perceptions of the educational benefits of using these tools in teaching.

To best understand the relationship between the faculty members and their intentions to use Web 2.0 tools in teaching and learning, the study will incorporate the Decomposed Theory of Planned Behavior (Taylor & Todd, 1995). This theory will be used to predict factors that influence Saudi faculty members' intentions to use Web 2.0 tools in their future classrooms.

1.4 Significance of the Study

With the rapid rate of technology expansion, it is becoming a daunting task to keep up with the new releases of technological applications and devices. The institutions of higher education are no exceptions to this rapidly growing technology as they attempt to build a technological infrastructure that meets the instructional and research needs for students, faculty, and staff (Alsaady, 2007). Web 2.0 tools and applications have many educational benefits such as connectivity, collaboration, knowledge creation, and

information sharing (Ajjan & Hartshorne, 2008; McLoughlin & Lee, 2007). Web-based technologies use in learning has increased significantly providing new opportunities for learners to interact with their peers and instructors (Li & Pitts, 2009). Thus, higher educational institutions that are looking to improve teaching and learning through the use of technology especially Web 2.0 tools and applications need to consider not only educating faculty members about the educational benefits of Web 2.0, but also how to successfully integrate Web 2.0 tools in their classroom. At these institutions, the use of technology and how to integrate technology successfully into the courses is a requirement to meet the needs of student population that is considered the most technological advanced generation (Zelick, 2013). However, since the adoption of technology, especially Web 2.0, is a decision that is mostly in the hands of faculty, identifying and understanding factors that influence faculty's adoption of such technology could help facilitate the integration and use of Web 2.0 tools in higher education. Additionally, it is important to see how faculty members are using Web 2.0 tools outside the classroom to assess their level of comfort with these technologies and understand their perceptions of the educational benefits of Web 2.0 tools. This understanding may assist institutions of higher education to effectively implement and integrate Web 2.0 in higher education classrooms.

1.5 Research Questions

This study is designed to answer the following questions:

Research Question 1: What are the Saudi Arabian faculty perceptions of the benefits of using Web 2.0 tools to supplement the traditional classroom instruction?

Research Question 2: What factors best predict Saudi Arabian faculty intentions to adopt and use Web 2.0 tools in their future classroom to supplement classroom instruction?

1.6 Research Hypotheses

To answer the above questions, the Decomposed Theory of Planned Behavior will be used to examine and understand both the Saudi Arabian faculty members' perceptions of Web 2.0 tools, as well as their future intentions to use Web 2.0 tools in classroom teaching. Based on the above questions, the researcher developed the following hypotheses:

H1: Saudi faculty members' behavioral intention to use Web 2.0 tools positively affects behavior.

According to the Theory of Planned Behavior (Ajzen, 1991), behavioral intention can be used to predict a specific action. Prior research has used behavioral intention as a predictor for technology adoption and use (Ajjan & Hartshorne, 2008; Paver, Walker, & Hung, 2014; Sadaf, Newby, & Ertmer, 2013; Taylor & Todd, 1995). Thus, it is expected that behavioral intention may have a positive relationship with Saudi Arabian faculty adoption and use of Web 2.0 tools.

H2: Attitude of Saudi Arabian faculty members towards using Web 2.0 tools positively affects behavioral intentions:

- a. Perceived usefulness positively affects attitudes to use Web 2.0 tools;
- b. Perceived ease of use positively affects attitudes to use Web 2.0 tools;
- c. Perceived compatibility positively affects attitudes to use Web 2.0 tools.

Prior research has shown that attitude influences behavioral intentions (Ajzen, 1991). In addition, previous studies have indicated that attitude has a positive relationship with

behavioral intentions (Ajjan & Hartshorne, 2008; Paver et al., 2014; Sadaf et al., 2013; Taylor & Todd, 1995). Therefore, it is expected that Saudi Arabian faculty's attitude positively influence their intention to use Web 2.0 tools. Past literature has found that perceived usefulness, perceived ease of use, and compatibility may impact behavioral intentions through attitude (Taylor & Todd, 1995). Thus, in regard to Saudi Arabian faculty's attitude, these three components are expected to have positive relationship with attitude.

H3: Subjective norms of Saudi Arabian faculty members in regard to using Web 2.0 tools positively affect behavioral intentions:

- a. Superior influence to use Web 2.0 tools positively affects the subjective norms of Saudi Arabian faculty members;
- b. Peer influence to use Web 2.0 tools positively affects the subjective norms of Saudi Arabian faculty members;
- c. Student influence to use Web 2.0 tools positively affects the subjective norms of Saudi Arabian faculty members.

Since different groups in an individuals' social circle could have an impact on their intention through subjective norms (Taylor & Todd, 1995), it is expected that peers, superiors, and students can have positive relationship with behavioral intention through subjective norms (Ajjan & Hartshorne, 2008; Paver et al., 2014; Sadaf et al., 2013; Taylor & Todd, 1995).

H4: Perceived behavioral control of Saudi Arabian faculty members in regard to using Web 2.0 tools positively affects behavioral intentions:

- a. Saudi Arabian faculty members' self-efficacy of using Web 2.0 tools positively affects perceived behavioral control;
- b. Facilitating technologies' conditions positively affects Saudi Arabian faculty members' perceived behavioral control;
- c. Facilitating resources' conditions positively affects Saudi Arabian faculty members' perceived behavioral control.

Past research has indicated that perceived behavioral control is a significant determinant of behavioral intention and actual behavior (Taylor & Todd, 1995). Therefore, it is expected that Saudi Arabian faculty's intention to be impacted by self-confidence and the resources they have access to in order to use Web 2.0 tools in their classroom.

1.7 Definition of Terms

The following terms will be used throughout the dissertation in the discussion of technology in higher education.

Audio/Video conferencing. This term refers to web-based applications that are used for audio and video communication such as Skype and Facetime.

Blogs. A blog is an online journal that consists of brief paragraphs of opinions and information arranged in a chronological order with the most recent entry viewing first (Anderson, 2007).

Content collaboration. This term refers to web-based applications that allow its users to collaborate by creating, editing, and sharing a document or presentation. Some of the most used content collaboration tools are Google Drive, Microsoft OneDrive, and Prezi.

DTPB. This abbreviation refers to the Decomposed Theory of Planned Behavior that is an extension of the Theory of Planned Behavior (Ajzen, 1991), which is designed to

explain the adoption of technology by exploring the social, institutional, and personal factors that influence the use of technology.

Instant Messaging (IM). This term refers to web-based applications that can be used to exchange and send messages that include text, pictures, video, and links. Some example of the most used IM are: WhatsApp and iMessage.

Media sharing. This term refers to web-based applications that allow its users to create and share pictures and videos with others. Some examples of the most used media sharing tools are: YouTube and Instagram.

Perception. This term refers to the way in which something is understood or interpreted ("Perception," 2019).

Social networking sites. This term refers to websites that allow its users to connect and build a community of family, friends, colleagues, and people with a common interest.

Web 2.0. This term refers to a service that include tools, websites, and applications which are built by social software and enhance by the social connectivity of World Wide Web (Alexander, 2006).

Wikis. A wiki is a type of website that enables its users to contribute and edit its content and does not required any knowledge of webpage development or programming.

Wikipedia is one of the most used wiki.

1.8 Summary

In this chapter, statement of the problem, purpose of the study, and significance of the study were presented. Research questions and research hypotheses were developed based on the purpose of the study. The remaining of this study is structured into four chapters. The second chapter provides the literature review of Web 2.0 tools, educational

benefits of using Web 2.0 tools in higher education, the Saudi Arabian higher educational system, and the theoretical framework of the Decomposed Theory of Planned Behavior. The third chapter discusses the methodology and data analysis for this study. The fourth chapter presents the results of the study. Finally, the fifth chapter provides discussion of the findings, implications for practice, and recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

This study is designed to investigate Saudi Arabian faculty use and perceptions of Web 2.0 tools in higher education. It also aims to understand factors that influence Saudi Arabian faculty to use Web 2.0 tools in their classrooms. This topic was selected due to the current importance of Web 2.0 tools and technologies in people's lives, especially in the educational field. It is informed by constructivism that can be traced to Jean Piaget, andragogy by Knowles (1980), and the decomposed theory of planned behavior by Taylor and Todd (1995).

Technological innovations have made an enormous impact on the way people work, learn, and teach: "It has become central to people's reading, writing, calculating, and thinking, which are major concerns of schooling" (Collins & Halverson, 2010, p.19). To remain competitive in the information age, organizations, especially in education and business, must evolve to take advantage of the different technologies and tools that are available. The merging of information technology and education has created what is known as electronic learning, which enables learners to acquire knowledge and share information through new and different tools using the World Wide Web (McLoughlin & Lee, 2007). Today's students are learning through unconventional channels such as blogs, wikis, podcasts, and video streaming tools (Mason, 2016) and have new role as learners in which they are more active and participatory. Students today are using Web 2.0 tools and technologies including blogs, wikis, social networking sites, and media sharing tools to search, collaborate, create, and share information (Aifan, 2015). Web 2.0 tools are an example of a genre of technology utilized in almost every type of classroom (Anderson, 2007). Web 2.0 tools are web-based technologies and applications that can be used to

generate content by their users (Kassens-Noor, 2012). Although Web 2.0 tools mostly were not intended for educational purposes (Hartshorne, Ajjan, & Ferdig, 2010), it has been suggested that these tools could provide opportunities for changing the way we teach and learn and have positive effects on student engagement and learning experience (Konstantinidis, Theodostadou, & Pappos, 2013). Web 2.0 has emerged as a significant learning innovation because of its features and the great potential educators and scholars see in this innovation. Web 2.0 tools have been used to facilitate student collaboration, ideas and knowledge sharing, and interaction and communication with others (Anderson, 2012; Orehovacki, Bubas, & Konecki, 2009). Therefore, students have the opportunity to become actively engaged in the learning process by searching, gathering information, and creating content that can be shared with others (peers and teachers) through Web 2.0 applications (Hartshorne et al., 2010; Mason, 2016; Tunks, 2012). Most educational organizations and institutions are equipped with standard technologies (i.e. Internet, computers, and laptops) that allow access to Web 2.0 tools; however, integrating these technologies into the curriculum is a decision that is usually made by the faculty members (Buchanan et al., 2013; Soomro et al., 2015). Numbers of factors can affect the faculty decision to adopt Web 2.0 tools, such as usefulness, ease of use, the compatibility of these tools with course content, and self-efficacy. This study aims to explore Saudi Arabian faculty perceptions and use of Web 2.0 tools in the classrooms and understand factors that influence the adoption of these tools.

This chapter reviews the literature related to this study such as Web 2.0, Web 2.0 tools in higher education, the educational affordances of Web 2.0 tools, the issues and

barriers affecting technology integration, the Saudi Arabian higher education, and the Decomposed Theory of Planned Behavior.

2.1 Web 2.0

In the information age, the World Wide Web is becoming a place for users to be interactive, creative, and real-time participants, all of which are concepts associated with Web 2.0 (Allen, 2013; Bennett et al., 2012). Web 2.0 is a platform that hosts web-based applications providing commercial, entertainment, and learning services (Anderson, 2012). This term “Web 2.0,” was coined by O’Reilly in 2005, and refers to the web-based technology that supports communication and sharing of information (Tunks, 2012). Web 2.0 enables users to be actively engaged with content as opposed to viewing information passively or just consuming web content. Therefore, Web 2.0 is capable of harnessing collective intelligence, as noted by O’Reilly (2005). According to Donelan, Kear, and Ramage (2012), Web 2.0 involves a shift from a static content to a dynamic platform based on collaboration.

Another attempt to define the term Web 2.0 was undertaken by Kaplan and Haenlein (2010) in which they described it as a platform whereby content and applications are continuously modified by all users in a collaborative fashion instead of being created and published by individuals. In that context, Web 2.0 is used to describe a new way in which software developers and end-users are utilizing the World Wide Web. Another definition depicts Web 2.0 as a series of tools, websites, and applications that are based around social software and facilitated by the social connectivity of the World Wide Web. This aspect of Web 2.0 has created a new version of the Web in which users feel a

part of interactive online community and have the opportunity to interact with other individuals (Burhanna et al., 2009; McLoughlin & Lee, 2007).

In general, Web 2.0 can be defined through two key concepts. First, Web 2.0 is a user-driven platform that provides services and applications, which can be shared and used for content collaboration (Alexander, 2006). Second, data is essential for many Internet-based applications including Web 2.0 tools. Therefore, database management is a key component of Web 2.0 (O'Reilly, 2005). Web 2.0 companies are creating some of this data, however, the users of these Web 2.0 tools and applications provide the other portion of these data. These tools collect data about the users' actions each time users access and use the services provided by Web 2.0 tools. Web 2.0 platforms are robust in which the generated and collected data are profoundly huge and need to be managed effectively. Web 2.0 tools provide ways to collect and manage data in purposeful and reusable forms (Anderson, 2007). Without data, the services provided by Web 2.0 technology would be useless, and without these services, the data would be unusable (Mason, 2016).

Shang, Li, Wu, and Hou (2011) claimed that Web 2.0 is used to build applications that get better the more people use those applications. Because Web 2.0 supports feedback, conversation, and networking along with social interaction, learning in the "social" Web 2.0 is characterized as a community of practice in which people interact and share their interests by learning together and developing rich resources. According to Shang et al. (2011), Web 2.0 applications or tools consist of four components. Each of the components has different functions. These four components are:

- socialization in which users are able to observe the web content and participate in web community;
- externalization in which users are able to send out information through emails, instant messages, and audio/video calls;
- combination in which users are able to share resources and mashing up content using blogs and wikis; and
- internalization in which users are able to reflect Web 2.0 content on strategy implement by sharing of best practices and “learning by doing” through content editing and co-development.

It has been suggested that most learning experiences are comprised of formal learning, which is the structured learning that happens inside the classroom, and informal learning that rests in the hands of the learners (Dabbagh & Kitsantas, 2012). There is growing research showing that Web 2.0 tools and technologies are increasingly supporting informal learning in home, which has become an important element of education (Rich, 2008; Selwyn, 2007). Moreover, learning through Web 2.0 tools contributes to the transformation of the present learning and education systems according to the needs and requirements of the present labor sector (Fralinger & Owens, 2009).

2.2 The Educational Theory

Learning theory should inform teaching and learning for best implementation of Web 2.0 (Cochrane, 2006). Collaborative learning, social learning, and active learning can be facilitated through the use of many Web 2.0 tools (e.g. blogs, social networking, and media sharing, etc.) As Web 2.0 tools have great potential for actively engaging learners in collaborative learning and learner-centered environments, the theoretical

framework that would support using and implementing Web 2.0 tools in teaching and learning can be drawn from constructivism. Page and Ali (2009) noted that Web 2.0 tools support constructivist learning by using the affordances found in Web 2.0 applications.

Constructivism can be traced to Jean Piaget. He believed that knowledge can be acquired through continuous self-construction by interacting with the surrounding environment (Driscoll, 2000). Constructivists view learning as a process of being actively engaged in constructing knowledge by relying on the past acquired knowledge and the continuous experience of the learner (Chiou, 2011). In the learning process, learners actively seek meanings rather than passively waiting to be filled like an empty vessel (Driscoll, 2000). Cooper (1993) also stated that in constructivism, “learning is problem solving based on personal discovery” (p. 17). Moreover, learning goals in constructivism theory focus on learning in the context of meaningful activity in which learners acquire concepts or routines and apply them to solve relevant problems in real life (Driscoll, 2000). Constructivist instruction allows the learners to identify and pursue their own learning goals. Learners have the opportunity to explore and learn something that interests them in the manner they prefer, promoting self-regulation. Self-regulation is a desirable outcome for constructivist educators (Driscoll, 2000).

Since constructivists believe that learning and thinking can be developed through social interaction, they view collaboration as a critical feature in the learning environment (Driscoll, 2000). Collaboration does not mean just to work in groups and share the individual's knowledge, but also to provide collective insights and solutions. Moreover, collaboration in the learning environment exposes learners to different points-of-view other than their own (Driscoll, 2000). The advancements in technology, including the

emergence of Web 2.0 tools and applications can facilitate such learning and provide a platform for collaboration and active learning (Page & Ali, 2009). For instance, blogs and wikis have been found to be useful for developing and enhancing the writing skills among English language learners (Avci & Adiguzel, 2017; Aydin & Yildiz, 2014; Brodahl & Hansen, 2014; Novakovich, 2016). Also, content sharing tools like Google Drive promoted collaboration among students and enhanced knowledge retention (Orndorff, 2015).

To implement instructions developed and based on constructivism concepts means to change the learners' and the instructors' roles. Chiou (2011) noted that learners in this type of learning environment will be actively engaged in constructing new knowledge, reflecting on their experience and collaborating with others, rather than being passive receivers acquiring knowledge from books and lectures. On the other hand, instructors will be giving away their position of authority, developing more of a facilitator role rather than being the primary source of information. These changing roles may create some challenges to implementing instruction that supports the use of Web 2.0 tools. These issues, in turn, can make both learners and instructors insecure about their new roles or cause them to resist the change (Chiou, 2011).

As constructivist approaches are predicated upon the assumption that knowledge is constructed by the learners through social interaction, Web 2.0 tools can aid and facilitate these approaches (Franklin & Harmelen, 2007). In the following section, some of the constructivist approaches such as collaborative learning, social learning and active learning will be discussed, as well as how these approaches relate to Web 2.0 tools.

2.3 Educational Affordance of Web 2.0 Tools

In this section, the educational affordances of Web 2.0 tools that are drawn from some of the constructivist approaches as they relate to higher education will be discussed. Some argue that students in higher education may learn differently from students in general education, so they should be taught using different strategies (Ekoto & Gaikwad, 2015). Higher education is concerned with adult learning, which is known as andragogy. Andragogy is defined as the art and science of helping adults learn, whereas pedagogy is defined as the art and science of educating children. The American educator, Malcolm Knowles, popularized the study of adult learning (i.e. andragogy). Knowles based his andragogical model on four assumptions: a) the learner's self-directedness; b) the learner's experience for learning; c) the learner's readiness to learn; and d) the educational shift from subject-centered to performance-centered approaches (Knowles, 1980). A fifth assumption, the learner's motivation, was added later. A key concept in andragogy is that adults and children have different learning characteristics (Knowles, 1980). These differences affect the instructions and the instructional strategies used to teach adults and children (Ekoto & Gaikwad, 2015). Since Web 2.0 tools have the ability to create and foster new learning environments that are ideal for supporting different kinds of learners and learning experiences (Brown & Adler, 2008), these tools can be beneficial for adult learners (i.e. students in higher educational institutions). Web 2.0 tools have emerged as a significant learning innovation because of their features, which underpin some well-known learning strategies identified as good practices in undergraduate education (Chickering & Gamson, 1991). Some of these strategies are:

collaborative learning, social learning, and active learning. In the following sections, brief discussions of how Web 2.0 tools may aid these learning strategies are presented.

Collaborative Learning. In collaborative learning, students work with each other toward the same goal, which is discovering and constructing knowledge (Davidson & Major, 2014). Since Web 2.0 technologies are based on the idea of collective intelligence that allow users to connect, collaborate, share, and construct knowledge, as well as to generate content, these technologies are suitable to use for facilitating collaborative learning (Anderson, 2012; Hartshorne et al., 2010; McLoughlin & Lee, 2007). Examples of some Web 2.0 tools that can be used in collaborative learning include wikis, blogs, and Google Drive. Instructors and students can use these tools to facilitate teamwork on a project through some of the features found in these tools. These features include adding, editing, and providing comments and feedback (Alharbi, 2015). Zheng, Niiya, and Warschauer (2015) employed a design-based research method that included creating wiki activities that promoted collaborative learning. The findings revealed that in order to design effective collaborative activities using wikis, the following instructional strategies should be implemented: developing a learning community, supporting knowledge construction, and enabling cognitive apprenticeship.

Social Learning. According to Bandura's social learning theory (1977), individuals develop knowledge by observing, modeling, and interacting with others. The developed knowledge then can be used to inform the actions and behaviors of the individual. In the light of this definition, some Web 2.0 tools provide an environment for social learning. For instance, Carroll, Diaz, Meiklejohn, Newcomb, and Adkins (2013) found that using wikis in undergraduate public health courses fostered social learning by providing the

students with the means to compare, reflect, model, and assess their own and others' work based on observation and feedback. Additionally, the social networking aspect of Web 2.0 tools enables users to create, share, and publish their work through different platforms and specialized networks in their fields, which opens the door for receiving feedback from professionals in their respective fields and provides students with an authentic real-world experience (Anderson, 2012; Hartshorne et al., 2010). Web 2.0 tools also provide a means for peer-to-peer learning experience, which helps the learners acquire skills and attitudes necessary for the workplace in the 21st century: teamwork skills, technical skills, and communication skills (An & Williams, 2010; Hartshorne et al., 2010).

Active Learning. Active learning is one of the key principles that Chickering and Gamson (1991) have highlighted in their study on good practices in undergraduate education. Active learning enables students to engage with the content, which will facilitate learning by discovering, processing, and applying knowledge. The sense of ownership resulting from being actively engaged in their learning can enhance students' retention of concepts (Cherney, 2008). Some teaching practices that foster active learning include, but are not limited to, lively debates and discussions, reflective writing, and assignments that involve team or group work (Kassens-Noor, 2012). Wikis, blogs, Social Networking Sites, and Google Drive can be used as part of teaching practices to facilitate active learning (Dafoulas & Shokri, 2014; Hadjerrouit, 2013).

2.4 Issues and Barriers Affecting Web 2.0 Tools Integration

Web 2.0 tools can support the flexible delivery of courses (Chan, 2013). Wikis, instant messaging, and audio and video calls can be used to supplement some of the

activities in blended or online courses, as well as in face-to-face courses, where usually class time or class size may limit the numbers of activities to be used in the classroom (An & Williams, 2010; Cherney, 2008). However, as with every technology there are a number of issues and concerns that present challenges in integrating Web 2.0 tools in teaching and learning. These issues include faculty and student privacy, shifting pedagogical approaches, technology effectiveness, time of integration, technical issues, and lack of technical support (An & Williams, 2010; Anderson, 2007; Bennett et al., 2012; Reid, 2014).

Privacy. Privacy is considered to be an issue when it comes to technology, and Web 2.0 tools are no exception to privacy concerns. Faculty members and students alike have mentioned that privacy issues hinder their use of Web 2.0 tools in teaching and learning, especially when those tools are used outside a Learning Management System (An & Williams, 2010; Anderson, 2007). Privacy concerns may result from feeling uncomfortable with the openness of Web 2.0 tools and interacting publicly with peers. However, students and faculty should increase their knowledge about how to set and control access to their accounts and content by other users of Web 2.0 tools (Gunter & Gunter, 2014). Furthermore, institutions can provide measures and develop guidelines and policies to ensure the privacy of students and faculty when using Web 2.0 tools. For example, a number of universities in the United States are implementing local instances of Web 2.0 tools within their private networks to offer students the benefits of some Web 2.0 tools without compromising the students' privacy. Other institutions provide privacy checklists for faculty and staff that comply with Family Educational Rights and Privacy Act (FERPA) guidelines. Moreover, some institutions provide their faculty members and

students with materials that educate them about some of the privacy issues pertaining to utilizing Web 2.0 tools, as well as tips about how to protect their privacy and restrict access to account information and content to the involved parties (“7 things you should know about privacy in Web 2.0 learning environments,” 2010).

Task-Technology Fit. Task-technology fit refers to designing a task that aligns with the intended learning outcome by utilizing a certain type of technology, in this case a Web 2.0 tool (Bennett et al., 2012). Web 2.0 tools encourage active and collaborative participation to generate content, which makes them suitable to be used as approaches to collaborative learning and active learning. However, using Web 2.0 tools in teaching and learning may require faculty to shift from using traditional instructional approaches to ones that support collaborative learning and active learning, as well as promote learner-centered approaches, a shift which could be considered a barrier to incorporating Web 2.0 tools (Reid, 2014). Nevertheless, “task-technology fit” presents a challenge in utilizing Web 2.0 tools in learning and teaching. Faculties must note that Web 2.0 tools should be used only to enhance the teaching and learning experience and to help accomplish the desired learning outcomes, not for the sole purpose of their availability (Bennett et al., 2012). Faculties’ low-familiarity of how to utilize and integrate Web 2.0 tools in their courses may prevent them from effectively integrating Web 2.0 tools (Hartshorne et al., 2010).

Lack of Time. Time is another barrier that could affect the use of Web 2.0 tools. Learning new technologies and how to effectively integrate them into courses may cause course development to take more time (Reid, 2014). Rogers-Estable (2014) found that lack of time to learn a new technology was one of the most reported barriers of using

Web 2.0 tools in higher education by faculty members, along with the lack of training and support. Moreover, the speed at which new technologies are being developed is faster than the speed at which educators adopt and integrate technology into their instruction (Chiou, 2011). As for students, learning a new technology can take time away from learning the course content. When using new Web 2.0 tools in teaching, instructors should plan for providing the proper scaffolding and adequate support to help students teach themselves how to use them (An & Williams, 2010).

Technical Issues and Reliability. Another challenge with integrating Web 2.0 technologies may relate to technical issues. Web 2.0 tools consistently require updates and modifications. These rapid changes may present a technical challenge for faculty and students as both are required to keep up with the technology and the updates (Bennett et al., 2012). The continuous modifications of Web 2.0 tools may make them seem unreliable to some faculty, an issue which may prevent their utilization. Faculty might be discouraged to use a technology if it did not work as they intended the first time (Osika, Johnson, & Butea, 2009; Reid, 2014). Often, higher educational institutions do not support Web 2.0 tools. The lack of technical support may also discourage faculty and students from using Web 2.0 tools (An & Williams, 2010; Reid, 2014).

If handled carefully, faculty members and students can use Web 2.0 tools to create a learning environment that is innovative and promotes an engaging learning experience. On that account, faculty members and students should take into consideration the challenges they may face when utilizing Web 2.0 tools and to be cautious about any existing policies and regulations regarding integrating Web 2.0 tools. With appropriate

planning and implementation, faculty and students can benefit greatly from utilizing Web 2.0 tools.

2.5 Web 2.0 Tools Uses in Education

Web 2.0 tools are unique in that they can encourage user participation and openness. They provide a platform for collaborative creation of content and allow for content reuse to produce new ideas (Burhanna et al., 2009; Mason, 2016). According to Rich (2008), Web 2.0 competencies could be classified into two categories: necessary competences and supplementary competences. The former category includes abilities such as searching accurately and judging the authoritativeness of the material in order to produce a work that is well informed. The latter category allows users to use Web 2.0 tools for more in-depth searching and possibly making contributions. These competences include having a structural knowledge on how these Web 2.0 tools function, being able to synthesize information from multiple resources, and participating actively in discussion. In the following section, some of the most popular types of Web 2.0 tools are discussed along with their uses in teaching and learning in higher educational systems.

2.5.1 Blogs

Blogs are a dialog among a group of people who share the same interests in a certain topic or subject. A blog can contain text, multimedia, and links to websites. Blogs allow users to share information with others and comment on others' posts (Smaldino, Lowther, & Russell, 2012). Blogging is a great way to teach writing skills, communicate ideas, provide recommendations to others, post presentations, and reflect on one's own work, as well as the work of others, all of which can create a dynamic learning environment and stimulate analytical and critical thinking skills (Alharbi, 2015;

Bartolomé, 2008; Mason, 2016; Smaldino et al., 2012; Soomro et al., 2015). For example, a study by Novakovich (2016) examined the impact of blogs on the writing skills of university students in an English course, as measured by grades and the quality and the quantity of comments generated on the blog entries. The results suggested that blogs had an impact on the quality of the students' writing. The study concluded that students publishing a draft or a work-in-progress piece allowed the instructor to manage and monitor students' work. Furthermore, this study demonstrated that the students who used blogs in their writing assignments were authentically engaged and spent more time on task than students who were using traditional methods (i.e. pen and paper, Novakovich, 2016).

Blogs have been highly effective with English Language Learners and their achievement. Alharbi (2015) investigated the effects of using blogs among other tools (discussion boards and wikis) on students' performance in an English as a Foreign Language program (EFL) in a university-level reading and writing course. The researcher used an experimental control group research design with pre-test and post-test. The findings from this study suggested that using these Web 2.0 tools (i.e. discussion board, blogs, and wikis) in teaching reading and writing could yield noticeable improvement in reading and writing skills among English language learners. Additionally, these Web 2.0 tools were found to be useful in facilitating collaborative learning and social interaction and fostering the development of students' literacy skills (Alharbi, 2015). Lin, Li, Hung, and Huang (2014) investigated the effects of blogging on writing skills in an EFL writing course for undergraduate students as well. The study involved two groups of students in which the experimental group was required to create a daily blog entry, while the control

group used the traditional pen and paper method to keep a class journal as an activity to practice writing skills. The findings indicated that blogging had a positive impact on EFL student writers in terms of improving writing skills and enhancing learner attitudes towards writing.

Other studies evaluated the use of blogs in teaching and learning in higher education by exploring students' perceptions, satisfaction, and performance. For instance, Karvounidis, Chimos, Bersimis, and Douligeris (2014) surveyed students' perceptions and learning experience with blogs, wikis, and podcasts. The results from the study revealed that blogs could be considered as a stimulus for learning and a tool for enhancing communication, both of which could increase students' engagement. Jackling, Natoli, Siddique, and Sciulli (2015) investigated student attitudes toward using blogs as an interactive and reflective learning tool at an Australian university. The findings indicated mixed views toward using blogs, but differences between the attitudes of international students and domestic students, in terms of viewing blogs as a tool to facilitate reflection and interaction among students, were reported in the study. International students reported more positive attitudes than domestic students toward using blogs as a means to reflect on their learning and to collaborate in a group work.

2.5.2 Wikis

A wiki is a web page that allows the users to interact or share content in real-time. Users can add, remove, or change information posted on a collaboration site (Smaldino et al., 2012). Wikis can be public, in which case everyone can view and edit content, or can be private, in which case access is limited to a specific group of people (Mason, 2016). Wikis provide opportunities to be actively engaged in learning and to develop an online

learning community (Alharbi, 2015). Wikipedia is a well-known example of a wiki that contains current information about various subjects, even though the information may not necessarily be accurate. In higher education, wikis can support collaborative work on projects by knowledge sharing and creation (Baro, Idiodi, & Godfrey, 2013; Bartolomé, 2008). Students consider wikis the most important Web 2.0 tools for promoting learning (Hartshorne & Ajjan, 2009). For example, a study by Aydin and Yildiz (2014) investigated the use of wikis to promote collaborative writing in learning English as a foreign language. Thirty-four students were asked to complete three writing assignments using wikis in groups of four. The gathered data from the assignments, focus group interviews, and questionnaire results revealed that using wikis in collaborative writing had led to accurate grammar use. Moreover, students had positive experience with using wikis in the collaborative writing assignments and believed that their performance had improved (Aydin & Yildiz, 2014). Kear, Donelan, and Williams (2014) investigated the effectiveness of using wikis to facilitate students' collaboration in online courses. In this study, students believed that wikis could be a valuable tool when developing group projects. Usefulness and ease of use were important factors that influenced the students' use of wikis. However, the use of wikis was less well perceived by the instructors involved in the study due to the increased workload. The study suggested that constructing more structured wiki activities could reduce the workload.

Chu, Siu, Liang, Capio, and Wu (2013) investigated students' experiences and perceptions on using two different wikis tools: Media Wiki and TWiki. The findings indicated that students viewed both wiki tools as effective tools for group projects and knowledge sharing and construction. The study suggested that wikis should be considered

as a tool to support collaborative learning. However, a successful implementation of wiki activities requires an appropriate pedagogical support (Zheng et al., 2015).

2.5.3 Social networking

Twitter and Facebook are examples of well-known social network sites (SNSs). SNSs require users to create a profile or account by answering some questions regarding age, location, and interests, and the user can upload a profile photo if they prefer. Through SNSs, users can connect with family, friends, co-workers, or individuals who share the same interests and establish a variety of networks (Boyd & Ellison, 2007; Smaldino et al., 2012). Through these profiles or accounts, users can post and share their thoughts, ideas, or “status”. They also can share videos, audio clips, and links to web pages. In higher education settings, SNSs provide ways to communicate and collaborate in and out of the classroom (Kassens-Noor, 2012; Lei, Tomas, Zhang, Wan, & Man, 2012). For example, a study by Kassens-Noor (2012) compared using Twitter for communication and discussion in an undergraduate course to using the traditional method of in-class discussion and keeping a diary. The data were collected from tweets, in-class group discussions, quizzes, and journals. Content analysis of the gathered data indicated that using Twitter is better for knowledge sharing and creation and provides a platform for collaboration. However, the results also indicated that using the traditional method of keeping a journal and in-class discussion provided the students with more space to think and reflect.

To explore the ways in which Facebook is used as an educational tool, Chugh and Ruhi (2018) conducted a narrative literature review in which they reviewed 25 studies published on the use of Facebook in teaching and learning between 2013-2016. The

review concluded that Facebook was used for different purposes, including enhancing learning, improving participation and engagement, sharing information, and disseminating content. Moreover, the study suggested that the lack of faculty awareness of the different functions available on Facebook could have an effect on the low usage of Facebook in teaching and learning. Al-Dheleai and Tasir (2017) investigated students' perceptions of the use of Facebook for student-student interaction and the relationship between students' perceptions of using Facebook and their academic performance. The findings from the study indicated that in general, students had a positive perception of using Facebook to interact with their peers for learning purposes. Students also had a positive perception regarding using Facebook as a platform to discuss course content and share information outside of the class. The study suggested that online interaction among students using Facebook could enhance students' academic performance.

Likewise, Naveen and Nagesh (2017) investigated the general influence of SNSs on students' academic performance. The data collected from 126 survey responses revealed that a little over 14% of the participating students used SNSs for academic purposes. These academic activities included getting in touch with instructors and/or researchers, disseminating research output and course materials, uploading documents to a group, and downloading lectures. The study concluded that SNSs are great tools for sharing information and improving reading skills. However, the study highlighted some of the pitfalls of SNSs in terms of their effects on students' academic performance, as these SNSs could be a potential source for distraction and misuse (Naveen & Nagesh, 2017).

Jang (2015) examined the factors that drive students' technology choices for use in their learning activities and how these chosen technologies impacted their learning experience and performance. The technologies that were included in the study were Facebook, Dropbox, Google Drive, wikis, Twitter, Skype, email, and texting. The findings revealed that all of the 51 participants indicated that Facebook was their primary choice for use in their collaborative learning activities and team assignment coordination. In addition, the analysis of the data revealed that the factor of convenience appeared to have a great impact on students' choices for using a certain technology in team collaboration. The factor of convenience entailed three types: "convenient to everyone in the team, convenient of access and use, and convenient to collaborate with each other privately within the team"(Jang, 2015, p. 84).

2.5.4 Instant messaging

Instant messaging (IM) provides a way of synchronous communication between two or more individuals through short text-based messages. Most IM applications support the transmission of audio and video files as well (Mason, 2016). Some examples of IM applications include iMessage, WhatsApp, and Facebook Messenger. Students and instructors can use IM to communicate synchronously. Communicating through IM can promote active learning and one-on-one interaction with the instructors, as well as provide a way for prompt feedback (Wang & Morgan, 2008). Researchers from Sam Houston State University (SHSU) conducted a study to assess students' perceptions and preferences for current and emerging information technology in order to understand how to improve the library services provided to their students (Cassidy et al., 2014). The data were collected using an online survey that included questions regarding access to mobile

devices and Internet, usage of mobile devices, and perceptions and usage of popular Web 2.0 technologies like podcasts and IM apps. The results showed that the mobile phone was the most used mobile device among the participants (nearly 98.4%). The results also indicated that the students used their mobile phones mostly for texting rather than calling. Out of the 941 completed surveys, 63% of the respondents used IM services and 10% were interested in using them in the future. Furthermore, 62% of the responses indicated that they were interested in communicating with the library through IM services.

Although the SHSU library has provided IM services for ten years, the results from the survey demonstrated that students did not know about this service. All these results suggest that mobile phones can be an important tool that will help the university library push content and provide services for the students. The study concluded that designing an app or mobile-friendly website to promote library services including improved IM services could result in encouraging students to use the library (Cassidy et al., 2014).

To explore the technological, pedagogical, and social affordances of using IM in teaching and learning, Tang and Hew (2017) did a systematic review on the use of IM in educational settings. The review of 39 empirical studies noted technological affordances including the minimal cost of using IM, the fact that IM applications are friendly, the multimodality of these applications (i.e. they allow the exchange of text, pictures, audio, and video), and the ability to access and interact with content anywhere, at anytime. In terms of pedagogical affordances, the study found that IM applications had been used in journaling, dialogue, course material dissemination, peer feedback on collaborative writing, and assessment. As for social affordances, Tang and Hew (2017) found that social presence can be easily established while using IM applications. They concluded

that there are two factors that facilitate social presence. First, the friendly environment of IM applications allows multiple ways to convey messages using text, audio, video, picture, and emoticons. Secondly, the ability to be immediately notified of a message's arrival allows response in a timely manner, increasing interactivity. Moreover, closer student-teacher relationships were reported because students felt more comfortable approaching the teachers, and the teachers got to know their students better.

Some studies suggested that IM could help in improving language skills, facilitating interaction between students and instructors, and supporting classroom instruction. Avci and Adiguzel (2017) explored the effects of using IM application (WhatsApp) on the language proficiency of EFL students. WhatsApp was used as a way to facilitate discussion and coordinate working on a group project in an English language course. The data collected through peer evaluations, rubrics of the project, chat logs from WhatsApp, and interviews with the students, showed that language skills for EFL students were improved because of their participation in an authentic learning experience via WhatsApp group chat with their peers and instructors outside the classroom. The students had positive attitudes toward using WhatsApp to develop interpersonal and collaborative skills (Avci & Adiguzel, 2017). For second language learners, IM was a platform for involvement that encouraged participation, leading to improvement in writing skills. Andujar (2016) investigated the benefits of IM for second language learners in writing. The IM application called WhatsApp was used as a tool to communicate and support use of language outside the class and not to substitute in-class instruction. In the study, an experimental group used WhatsApp to communicate and answer a question on a daily basis within a group chat as an extra activity, while the

control group participated only in the in-class activities. Pre/post tests and a qualitative analysis of grammatical and lexical errors in the activities performed by the students were taken to measure the differences in the writing skills between the two groups. The results showed a significant difference between the experimental and control groups in terms of accuracy. These findings could imply the potential of IM to improve the accuracy of second language learners' writing skills (Andujar, 2016).

So (2016) explored the use of WhatsApp to support teaching and learning. The IM application was used to deliver course materials and activities outside school hours to reinforce the concepts learned in the class and to provide the students with a way of communication with each other and with the instructor. Two groups were involved in the study: an experimental group that received activities through WhatsApp outside of class to support the traditional classroom instruction and the control group that only received traditional instruction. The improvement of the students' learning was measured by their performance in the pre-test and post-test scores for both groups. The results indicated a significant improvement in the test results of the experimental group that could imply the effectiveness of using IM applications like WhatsApp to deliver activities outside the classroom to support classroom instruction. Additionally, data collected from the questionnaire to assess the usefulness and acceptance of using WhatsApp in this study revealed that students believed that WhatsApp can foster effective communication anytime, anywhere, support formal and informal learning, and allow prompt feedback (So, 2016).

2.5.5 Audio/Video conferencing

Many of today's mobile devices come with a built-in application that enables their users to make video calls (e.g. Facetime) and connect with others via video calling through Internet, without using telephone services or minutes plans (Gunter & Gunter, 2014). Some examples of these apps include but are not limited to: Adobe Connect, Skype, DUO, and Google Hangout. Audio and video conferencing can be used in the classroom to dialogue with external experts or broadcast live lectures to students in different locations (Clark, Logan, Luckin, Mee, & Oliver, 2009; Doggett, 2007). Synchronous communication engages students and provides social presence in a virtual classroom (Farrel et al., 2018). A type of synchronous learning is an audio/ video conferencing webinar, a presentation or lecture transmitted over the Internet using an audio/video conferencing tool (Farrel et al., 2018). Zoumenou et al. (2015) reviewed the literature to identify the best practices for conducting an interactive webinar. They concluded that a webinar that involves live discussions could be engaging for students and instructors, which in turn could improve learning outcomes. Claman (2015) compared the engagement level for two groups of nurse practitioner students who received instruction using synchronous and asynchronous learning methods. The results indicated that engagement scores were significantly higher for the students in the synchronous group compared to the students in the asynchronous group. The finding suggested that synchronous communication may have the potential to improve learning outcomes through increased engagement.

2.5.6 Media sharing

Media sharing applications allow users to upload and post photos and videos and to share them with other individuals, usually called followers or friends (Duffy, 2008; Salomon, 2013). Some of the most popular media sharing applications include Instagram, YouTube, and Flickr. In higher education, media sharing applications can be used to facilitate collaborative learning, knowledge sharing, feedback from instructors and peers, or self-assessment for students (Bennett et al., 2012). For example, Messner, Medina-Messner, and Guidry (2016) reported an original teaching idea involving how to use social media (Twitter and Instagram) to learn in an undergraduate online course in global health. Students were asked to design social media campaigns for nonprofit clients. These types of activities engaged the students, provided real life experience, and established a way to connect with professional communities. Furthermore, Budge (2015) observed the activities of an artist on Instagram and suggested that Instagram can play a powerful role in facilitating informal learning and could be utilized in formal educational settings especially the visual arts. Budge (2015) noted that Instagram can provide a means to engage students by interacting and connecting with peers and mentors, sharing their feedback, and establishing networks and communities of practice. UCLA Powell Library used Instagram to post pictures of special collections items to increase students' exposure to these special collections owned by the library (Salomon, 2013).

Students' perceptions on using these types of media sharing tools were reported in the literature. Moghavvemi, Sulaiman, Jaafar, and Kasem (2018) investigated students' perceptions on the usage of YouTube in their learning at a Malaysian university and found that students' used YouTube as a stress relief tool, a place to find information, and

an academic learning resource. The study concluded that YouTube is an effective tool for learning due to the fact that visual cues found in videos help students to understand and retain information easily. At a mid-Atlantic institution, students' ($N=221$) perceptions of using YouTube in teaching and learning indicated that more than 89% of the participants agreed or strongly agreed that YouTube can be used as a learning tool to engage students and more than 70% agreed or strongly agreed that YouTube can enhance teaching and learning (Buzzetto-More, 2014).

2.5.7 Content collaboration

Content collaboration tools provide users access to applications and services from any computer or mobile device via the Internet. These services include word processors, spreadsheets, and presentations. Not only do they facilitate collaboration and sharing content with others, they also provide a platform for online software and applications, and usually are free of charge (Weber, 2013). Some of the most popular content collaboration tools are Google Drive, Microsoft One Drive, and Dropbox. Educators can use the services provided by content collaboration tools to communicate with students, create classrooms, distribute course materials, send out assignments and quizzes, provide a platform for collaboration and teamwork, and provide feedback ("Elevate learning in higher education," 2018).

A number of studies suggested that students have positive perceptions using cloud computing and content collaboration tools in teaching and learning. Sadik (2017) surveyed 119 students at a university in Oman to explore their attitudes toward using Google Drive as a collaborative tool. The findings indicated that the perceived ease of use and usefulness of Google Drive influenced the students' attitudes significantly toward

their intention to use Google Drive. Brodahl and Hansen (2014) examined beginning educators' ($N=154$) perceptions of collaborative tools to support academic work through survey and reflection notes posted by the students. The results revealed that students indicated positive attitudes toward using collaborative tools for writing essay assignments. One of the advantages that were reported by the students is the ability to work from anywhere, anytime and the ability to work synchronously on the same documents. Erturk (2016) aimed to better understand and improve the use of Google Drive as a collaborative tool among students. Quantitative and qualitative data were collected in order to investigate the factors that influenced students' satisfaction and success with Google Drive. The results revealed that students' attitudes toward using Google Drive depended on their mastery of Google Drive skills; the better the student's practical skills, the more of a likelihood Google Drive will be used (Erturk, 2016).

Collaborative writing is also one activity that can be performed using a content collaboration tool like Google Drive. Orndorff (2015) investigated the effect of using Google Drive to take collaborative notes on academic performance. The results of the study suggested that taking collaborative notes could improve students' performance. Moreover, the study indicated that students who take notes on computers individually do worse than those who take notes in small groups (Orndorff, 2015).

Web 2.0 tools provide students with the opportunity to collaborate and participate in an active learning environment. Having students participating in wikis, blogs, and media creation and sharing allows them to demonstrate collaboration, peer evaluation, and communication (An & Williams, 2010; Bennett et al., 2012; Duffy, 2008). Also, the ability to construct and share information through some of Web 2.0 tools is another

feature that can be beneficial for the students (Buzzetto-More, 2014). However, the successful implementation of such tools requires certain conditions to be met in the educational system and in the status of technology integration. The following sections describe the Saudi Arabian higher educational system and the current development of Web 2.0 tools use in higher educational institutions.

2.6 Higher Education in the Kingdom of Saudi Arabia

According to the published report by the Saudi Arabian Ministry of Education in 2011 entitled “The current status of higher education in the Kingdom of Saudi Arabia”, the first college established in the country was in 1949. Until the year 2000, Saudi citizens had access to higher education through only seven public universities around the Kingdom of Saudi Arabia (Al-Hojailan, 2013). In the last decade, the number of universities and colleges has increased to 38 public universities and 30 private universities and colleges throughout the Kingdom. These universities and colleges award undergraduate, graduate, and fellowship degrees for both male and female students. All courses are taught in Arabic except technological, science, and medical fields, in which English is used. Education is provided for free for Saudi citizens who are enrolled in public universities and colleges. In the latest published statistics on higher education, 1,680,913 students were enrolled in the 2016 – 2017 academic year (“Higher education statistics,” 2017). Additionally, 83,884 faculty members were teaching at these universities and out of those, 49,760 were of Saudi nationality (“Higher education statistics,” 2017).

Three decades ago, the social environment of the Saudi Arabian culture imposed a certain type of norms and beliefs towards education and educators that were considered

to be conservative and traditional. “Conservative” refers to adhering to social norms that existed in the society and upholding beliefs that were drawn from a historical interpretation of Islamic laws. “Traditional” refers to employing teacher-centered instruction, in which the instructors are considered to be the primary source of information and knowledge and the students rely on them to obtain that knowledge. During that time frame, students coming into the Saudi Arabian educational system adapted to the notion that professors and teachers were assumed to always be right. Therefore, questioning their knowledge and opinions was considered to be disrespectful and a sign of ignorance (Hamdan, 2014). However, this is no longer the case (Al-Khalifa, 2010). The advancement in information and communication technology has exposed societies to new opinions, opportunities, and experiences. According to the Arab Social Media Report (2017), social media played an undeniable role in influencing change and shaping opinions regarding some common political and social beliefs in the Middle East and North African region (MENA). As a result of this advancement in technology and information students from MENA region, specifically those who were Saudi Arabian, were exposed to new ways of learning and thinking. Moreover, Saudi Arabian students who had the opportunity to study abroad experienced new modes of learning, including hybrid and online learning, and new instructional strategies and activities within their face-to-face classes (e.g. group discussions, problem solving, and critical thinking). These new experiences modeled other ways to teach and learn that were typically not used or recognized within the traditional Saudi Arabian educational system prior to recent times (Alebaikan & Troudi, 2010). There are few studies that have investigated the effect of Web 2.0 tools on the Saudi Arabian educational culture. It is crucial to study the

impact of integrating technological tools such as Web 2.0 tools, of which one of the main features is openness, in a conservative society like Saudi Arabia and its educational culture (Aifan, 2015). Khawaji (2016) challenged the Saudi higher education system to shift from teacher-centered to student-centered, and employ different teaching and learning strategies that motivate and promote student engagement, thereby increasing student achievement.

The higher education system in Saudi Arabia is considered to be a traditional system; however, it seems to be gradually transforming into a blended system (Alturki, 2014). The Saudi Ministry of Education took steps to improve the quality of higher education in terms of content and delivery. For instance, the Ministry established the National Center for e-Learning and distance education (Al-Khalifa, 2010). The main goal of this center is to spread and facilitate the integration of advanced technology in higher educational institutions. It supports research in the field and provides consultation for universities and colleges regarding technology integration and online education (Khawaji, 2016). The Ministry of Education encouraged universities to integrate web-based tools and technology in teaching and learning by founding deanships for e-learning and distance education within each public university. These deanships conduct workshops and seminars for faculty members in order to educate them about the advantages of using these technologies in teaching and learning and the process for effectively integrating technology to enhance students' access and interaction with the online course content (Alkhalaf, Nguyen, Nguyen, & Drew, 2013). As a part of these technologies, Web 2.0 tools are not integrated as they should be into the higher educational programs in Saudi Arabia (Al-Hojailan, 2013). Some of the reasons that have prevented the effective

integration of Web 2.0 tools in some Saudi universities include the lack of infrastructure, the lack of awareness of the importance and potential of these tools in higher education, and the lack of faculty members' experience with these tools (Al-Asmari & Khan, 2014).

Despite the growing interest in the use of Web 2.0 tools in Saudi higher education, there is little research on faculty's intentions to integrate Web 2.0 tools into instruction in higher educational institutions in Saudi Arabia. In this context, this study aims to explore the Saudi Arabian faculty use and perceptions of Web 2.0 tools in Saudi Arabian higher education and the factors that influence the use of Web 2.0 tools at the faculty end.

2.7 The Use of Web 2.0 Tools in Saudi Arabian Higher Educational Institutions

A number of studies from the Middle East and North Africa region (MENA) investigated the use of Web 2.0 tools in learning, the types of tools used, their use and impact on learning, as well as the perceptions of their users (both students and faculty). Some research reported that universities and faculty members mainly use Web 2.0 tools for communication and information sharing purposes (Ahmad, Hussain, & Aqil, 2013; Ramli, 2014). Other research attempted to evaluate the use of wikis, blogs, and discussion boards within Learning Management Systems (LMS) in an e-learning environment from the perspective of the students, as well as the effect of these tools on students' performance. Results indicated that these tools had a positive impact on students' engagement and motivation to learn through collaborative learning (Alzahrani, 2012), and students' performance was improved through the use of Web 2.0 tools (Alharbi, 2015). Isakovic and McNaught (2013) investigated the usefulness of Web 2.0

tools (blogs and discussion boards) from the learner's perspective, inquiring about what ways they think that these tools enhance the learning experience from the aspects of facilitating learning and promoting interactivity and reflection. Findings suggested that blogging aided the students' learning by promoting self-reflection in reviewing learned content. Moreover, blogging increased self-confidence among students, encouraged them to share and interact with their peers, and improved their writing skills. AlJeraisy, Mohammad, Fayyumi, and Alrashideh (2015) explored the effect of online discussion boards (a Web 2.0 tool) among undergraduate students at one of the Saudi universities. The researchers compared two groups of students who were studying similar topics, using a survey to rate the students' engagement, satisfaction, and grades; one group used discussion boards as part of the course instruction, while the other group did not use the discussion board. Findings suggested that students who used discussion boards were more satisfied and more engaged in learning the content.

It seems that Saudi Arabia, like its other world educational counterparts, uses technology in education, but the research available is foundational. Institutions of higher education in Saudi Arabia would benefit from more research to make informed decisions about the use of Web 2.0 tools and their usefulness for instructors and students. Saudi Arabian scholars evidence limited use of Web 2.0 tools, using only social networking tools, blogs, and discussion boards, when indeed there are a lot of other tools that have great potential, like media creation and sharing, content collaboration tools, and interactive presentation tools. Even with the evidence of the use of Web 2.0 tools among faculty from Saudi Arabia, there is a gap in the literature about faculty perceptions and intentions in regards to the use of Web 2.0 tools in teaching in higher education in Saudi

Arabia. This study will explore the factors that influence the adoption of Web 2.0 tools by the faculty and assess their awareness of the educational benefits of these tools to supplement the classroom learning experience.

2.8 The Decomposed Theory of Planned Behavior

In recent years, various theories have been developed in an attempt to understand the reasons behind the adoption of certain technologies by individuals. One of these theories is the decomposed theory of planned behavior (Taylor & Todd, 1995). The decomposed theory of planned behavior (DTPB) was chosen as a theoretical framework to understand the Saudi faculty intentions of using Web 2.0 tools in their teaching. Taylor and Todd (1995) compared three models that explain how and why individuals choose to use certain technology. These models were: the Technology Acceptance Model (TAM), the Theory of Planned Behavior (TPB), and the decomposed theory of planned behavior (DTPB). The DTPB is an extension of the Theory of Planned Behavior (Ajzen, 1991), which is designed to explain the adoption of technology by exploring the social, institutional, and personal factors that influence the use of technology. The relationship between behavioral intention and actual behavior can be used to predict specific actions (Ajzen, 1991). The DTPB decomposed attitudes, subjective norms, and perceived behavior control into belief-based indirect measures, in order to provide a comprehensive way to explore the factors that influence the adoption and use of new technologies (Taylor & Todd, 1995). Taylor and Todd (1995) concluded that DTPB provides better understanding of usage and behavior intention, which can provide insight into how to better implement technology. Several studies have shown the predictive power of DTPB (Ajjan & Hartshorne, 2008; Hartshorne & Ajjan, 2009; Paver, Walker, & Hung, 2014;

Sadaf, Newby, & Ertmer, 2013; Taylor & Todd, 1995); therefore, this theoretical model was selected for this study to explore the intention of Saudi faculty to use Web 2.0 tools. In the following sections, a description of the factors that influence the individual’s behavioral intention is presented. These factors are: attitude, subjective norms, and perceived behavior control (Figure 1).

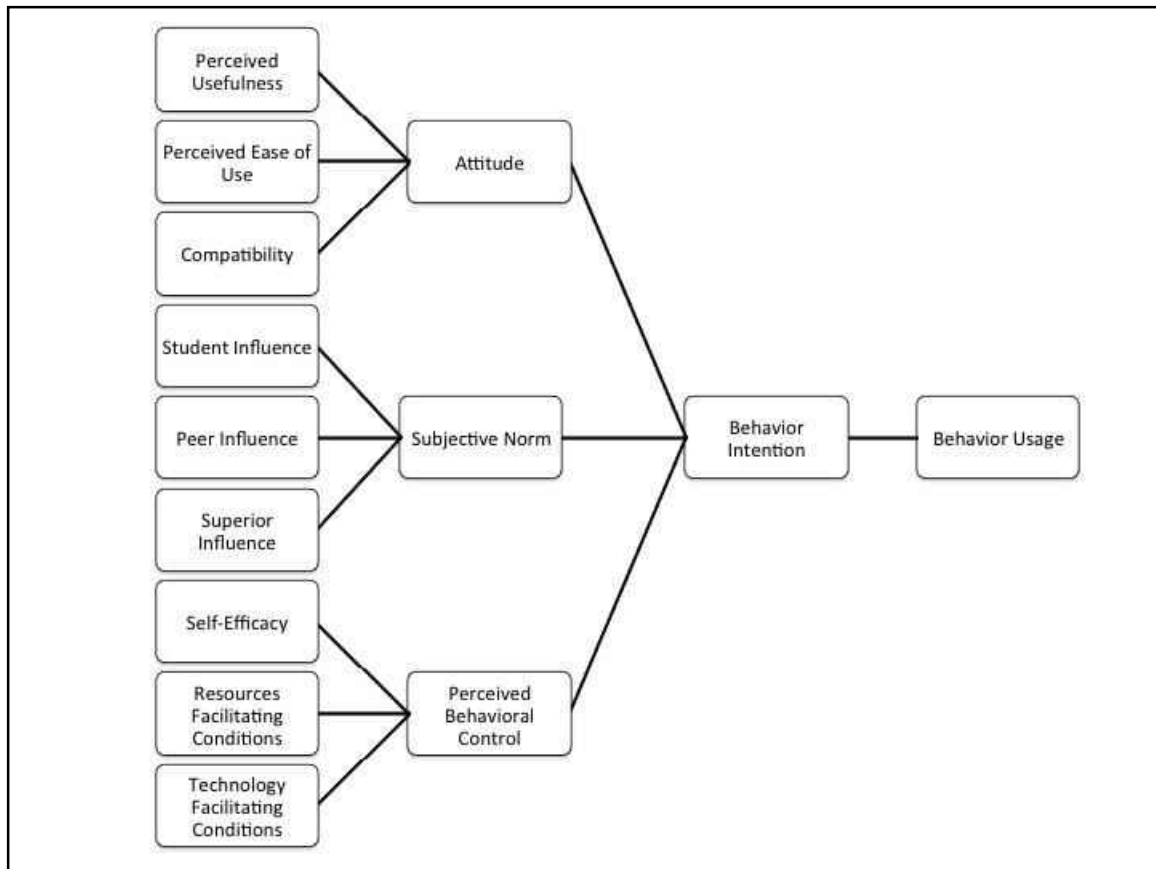


Figure 1. Faculty adoption of Web 2.0 tools based on the Decomposed Theory of Planned Behavior

Attitude. Attitude refers to the extent to which an individual favors a behavior.

Attitude consists of three components: perceived usefulness, perceived ease of use, and compatibility. The perceived usefulness is the extent to which the individual believes that the use of technology will enhance performance. In this case, to what extent do Saudi faculty members believe that the use of Web 2.0 tools will enhance teaching and

learning? The perceived ease of use refers to the degree to which a technology is easy to use, learn, or understand (Taylor & Todd, 1995). In this case, it refers to the degree in which Saudi faculty members feel that the use of Web 2.0 tools would require limited effort. The less complex the technology, the more likely the user will accept it.

Compatibility refers to the degree to which a technology fits within the potential user's existing behavior, experience, and needs. In this case, compatibility is the extent to which the use of Web 2.0 tools fit within the current role and responsibilities of the Saudi faculty members.

Subjective Norms. Subjective norm refers to the different social groups in the individual's circle who might influence the individual's behavior to use and adopt technology. In the context of this study, the social pressure on Saudi faculty members to use Web 2.0 tools would come from the following three groups: students, peers (other faculty), and superiors. Students would be more likely to support the faculty use of Web 2.0 tools (Taylor & Todd, 1995). However, other faculty might be less supportive of the use and adoption of Web 2.0 tools as they may view these tools as unnecessary change. On the other hand, superiors might be more supportive of the adoption of Web 2.0 tools as they feel these tools may improve student learning.

Perceived Behavioral Control. This factor refers to the extent to which an individual feels to have control over his or her behavior. Two factors influence the perceived behavioral control: self-efficacy and facilitating conditions. In the context of this study, self-efficacy refers to the faculties' view of their ability to use Web 2.0 tools in teaching and learning. Higher levels of self-efficacy have more positive influence on the behavioral intention and usage of Web 2.0 tools in teaching. Facilitating conditions refer

to the availability of resources to help and support the use and integration of the technology. In this study, facilitating conditions include the availability of the appropriate Web 2.0 tools, time, money, and support. The absence of any of these resources could represent barriers to use Web 2.0 tools, but the presence of these resources does not necessarily mean that usage will be increased (Taylor & Todd, 1995).

2.9 Summary

The advancement of the Web and technology has shifted the users from being consumers of information provided by others, to being creators and publishers of their own content. Web 2.0 applications such as wikis, blogs, social networking sites, media sharing, and communication services enable users to collaborate, construct, and share knowledge. Although Web 2.0 tools were developed for commercial and entertainment purposes, they have found their way into education because of their features and educational affordances.

The first part of this chapter discussed Web 2.0, the educational theory and affordances of Web 2.0 tools, issues and barriers of Web 2.0 tools usage in education, and the use of Web 2.0 tools in higher education. The second part described the higher education system in the Kingdom of Saudi Arabia and the use of Web 2.0 tools in Saudi Arabian higher education. However, there is a lack of literature surrounding the Saudi faculty adoption and use of Web 2.0 tools in higher education, particularly in examining the factors that influence or hinder faculty usage of Web 2.0 tools. This study aims to gain an in-depth understanding of Saudi Arabian faculty perceptions and use of Web 2.0 tools in their classroom instruction. The following chapter will discuss the methodology

used in this study to examine Saudi Arabian faculty use and perception of Web 2.0 tools in higher educational institutions.

CHAPTER 3: METHODOLOGY

3.1 Introduction

In the previous chapters, the need for an investigation of the intentions of faculty from Saudi Arabia to use Web 2.0 tools was established. This chapter discusses the methods used to gather data for the current study and the statistical procedures used for data analysis to answer the research questions stated in chapter one. This chapter includes the following sections: research design, research questions and hypotheses, research sampling, instrumentation, data collection procedures, and data analysis.

3.2 Research Design

This study utilized a non-experimental, survey quantitative research design to investigate Saudi faculty members' perceptions of using Web 2.0 tools in teaching and learning at Saudi universities. Quantitative research uses “numerical data to describe, explain, predict, or control a phenomena of interest” (Mills & Gay, 2016, p.6). Numerical data allows researchers to test hypotheses by examining relationships between the variables (Creswell, 2014). Quantitative research relies on statistical procedures to measure and understand the subject of the study (Creswell, 2014; Mills & Gay, 2016). Data for such research is usually collected through questionnaire or survey. Survey research “involves collecting data to test hypotheses or to answer questions about people’s opinions on some problem or issue” (Mills & Gay, 2016, p.192). Survey research can be used to collect information about certain group of individuals to learn about beliefs, attitudes, and behaviors. There are two different types of survey research: cross-sectional surveys and longitudinal surveys. A cross-sectional survey entails collecting data from a selected group of people at a single point in time in order to

discover current behaviors, attitudes, and beliefs in a population. On the other hand, a longitudinal survey entails collecting data two or more times to study a problem or issue over time (Mills & Gay, 2016). This study employed the cross-sectional survey method in order to examine Saudi Arabian faculty perceptions and use of Web 2.0 tools in their classrooms.

3.3 Research Sampling

According to the statistics provided by the Ministry of Education in Saudi Arabia, 83,884 faculty members were teaching at Saudi universities both public and private in the academic year of 2016 - 2017; out of those, 49,760 were of Saudi nationality ("Higher education statistics," 2017). From this large population, this study focused on one of the largest public universities in the Western region of the country. At this university, 7,287 faculty members were teaching in the same academic year; out of those, 5,497 were Saudis ("Higher education statistics," 2017). This public university has two separated campuses: one for males and another for females. Each of these campuses is provided with all the recreational, athletics, and cultural facilities. The university also has libraries that are equipped with resources and technology to serve the students and faculty members. This university offers undergraduate and graduate programs from 22 colleges. These colleges are:

1. College of Arts and Human Sciences
2. College of Medicine
3. College of Pharmacy
4. College of Home Economics
5. College of Economics and Administration

6. College of Environmental Design
7. College of Applied Medical Sciences
8. College of Dentistry.
9. College of Applied Sciences
10. College of Arts and Design
11. College of Computer and Information Technology
12. College of Engineering
13. College of Earth Sciences
14. College of Meteorology and Environment
15. College of Law
16. College of Tourism
17. College of Communication and Media
18. College of Maritime Studies
19. College of Education
20. College of Educational Graduate Studies
21. College of Nursing
22. English Language Institute

After contacting the Deanship of Graduate Studies at the university to obtain permission to conduct the study, the researcher sent an email containing a brief description of the study and purpose of the study along with a link to the electronic survey to the Graduate Studies Deanship (Appendix C). The Deanship of Graduate Studies forwarded the email to their faculty on the behalf of the researcher.

This study used a convenience sample since the participants in the study volunteered to respond to the survey that was sent to their emails. Convenience sampling, also referred to as haphazard sampling, is a sampling method that involves including participants who volunteered to be in the study and happened to be available (Mills & Gay, 2016). The survey was sent to the Saudi Arabian faculty members at the selected university. The total number of responses on the survey was 136. Once the partial survey responses were removed, a total of 103 of the responses were included in the data analysis

3.4 Instrumentation

The data for the present study were collected using an online survey. An online survey is considered to be inexpensive; it also facilitates targeting and distributing to a particular audience and provides prompt and large numbers of results in a very short period of time (Dillman, Smyth, & Christian, 2014). The instrument used for the present study is an online survey (See Appendix A) that was modified by the researcher and is hosted using the Qualtrics survey tool. Qualtrics is an online survey tool that is available to University of Central Florida (UCF) faculty and students. The survey is an adapted version of the one that was used in Ajjan and Hartshorne (2008), which was used to investigate faculty perceptions of Web 2.0 tools in higher education institutions in the United States. Dr. Richard Hartshorne granted permission to use and modify the survey via email in August 2017.

Ajjan and Hartshorne (2008) designed the survey using the Decomposed Theory of Planned Behavior (DTPB) as the guiding framework. Items included in the survey were adapted from previous studies (Baylor & Ritchie, 2002; Davis, 1989; Taylor &

Todd, 1995). The survey was pilot tested on a sub-sample from the intended sample. Cronbach's alpha was used to assess the internal reliability of the instrument. The results from the Cronbach's alpha ranged from 0.67 to 0.98, which is considered acceptable for exploratory research (Ajjan & Hartshorne, 2008). In the current study, the first section of the survey included demographic or background information about the participants such as gender, age, faculty ranking position, year of experience, and university. The second section of the survey includes items to measure the participants' comfort level with Web 2.0 tools (never use = 1, novice = 2, competent = 3, proficient = 4). Also, the second section included items that examine the participants' actual usage of Web 2.0 tools in the classroom (NA = 0, don't use and don't plan to use = 1, don't use but plan to use = 2, use occasionally = 3, frequently use = 4, always use = 5). Items pertaining the faculty perceptions of educational benefits of specific Web 2.0 tools in the classroom are also included in the second section of the survey. The third section of the survey included items exploring the factors influencing faculty decisions to utilize Web 2.0 tools in their future classrooms (See Appendix A). These items pertain to the following constructs from the DTPB: behavioral intentions, perceived behavioral control, attitudes, and subjective norms (Table 1) and use 5-point Likert-scale responses (where strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree = 1, and don't know = 0).

Table 1. The Constructs and their Corresponding Survey Items

Construct	Item
Actual behavior	
AU1	I believe that I could communicate to others the consequences of using Web 2.0 in the classroom
AU2	I would have no difficulty explaining why Web 2.0 technologies may or may not be beneficial
Behavioral intention	
INT1	I plan to use Web 2.0 technologies in my classroom
INT2	I intend to use Web 2.0 technologies within the next semester
INT3	I will add Web 2.0 technologies to my class next semester
Attitude	
ATT1	Web 2.0 is useful in my teaching
ATT2	The advantage of using Web 2.0 outweighs the disadvantages of not using it
ATT3	Using Web 2.0 is a good idea
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 incorporate in my classroom environment
Perceived usefulness	
PU1	I feel that using Web 2.0 will help my students learn more about the subject
PU2	I feel that using Web 2.0 will help improve students' satisfaction with the course
PU3	
PU4	I feel that using Web 2.0 will improve students' grades
PU5	I feel that using Web 2.0 will improve students' evaluation
	To help my students better learn the material, I will incorporate Web 2.0 technologies in the classroom
Subjective norms	
SN1	My peers are using Web 2.0 technologies in their classroom
SN2	My superior confirms my ability and knowledge to use Web 2.0 technologies in the classroom
SN3	My peers think I will benefit from using Web 2.0 technologies in my classroom
SN4	
SN5	My superior thinks it is important I use Web 2.0 technologies in my classroom
	My students think it is important I use Web 2.0 technologies in my classroom
Perceived behavioral control	
PBC1	Using Web 2.0 technologies is entirely within my control
PBC2	I have the knowledge and ability to use Web 2.0
Peer influence	
PI1	Peers who influence my behavior would think that I should use Web 2.0 technologies in the classroom
PI2	Peers who are important to me would think that I should use Web 2.0 technologies in the classroom
Superior influence	
SI1	My superior who influences my behavior would think that I should use Web 2.0 technologies in the classroom

SI2	My superior whom I report to would think that I should use Web 2.0 technologies in the classroom
Student influence	
ST1	Students who influence my behavior would think that I should use Web 2.0 technologies in the classroom
ST2	Students who are important to me think that I should use Web 2.0 technologies in the classroom
Compatibility	
Comp1	Using Web 2.0 technologies compatible with the way I teach
Comp2	Using Web 2.0 technologies fits well with the way I teach
Self-efficacy	
SE1	I would feel comfortable using Web 2.0 technologies
SE2	I could easily use Web 2.0 technologies on my own
SE3	I know enough to use Web 2.0 technologies
Facilitating conditions technology	
FCT	The Web 2.0 technologies are compatible with the computer I already use in the classroom
Facilitating conditions resources	
FCR	I can use Web 2.0 technologies using any computer connected to the Internet

Note: Adapted from (Ajjan & Hartshorne, 2008)

Upon reviewing the survey, several modifications were made. Ajjan and Hartshorne (2008) used Web 2.0 tool examples that are no longer used or popular in Saudi Arabia such as Seedwiki, MySpace, MSN Messenger, Yahoo Messenger, DimDim, and FlashMeeting. These have been replaced with tools such as: WhatsApp and iMessage under instant messaging; Twitter under social networking; and Google Hangout and Skype under audio/video conferencing tools. Media sharing tools (e.g. YouTube and Instagram) and content collaboration tools (e.g. Prezi, Microsoft One Drive and Google Drive) were added to reflect current trends.

Table 2 includes all the Web 2.0 tools that were added in the survey. The survey was available in both languages (English and Arabic) for the participants' convenience.

Table 2. Web 2.0 Tools Included in the Survey

Web 2.0 Technology	Web 2.0 Applications
Blogs	Tumblr, Blogger, WordPress
Wikis	Wikipedia, Wikispaces
Social Networking Sites	Facebook, Twitter, Linked IN
Instant Messaging	WhatsApp, iMessage
Audio and Video Conferencing	Skype, Google Hangouts
Media Sharing	YouTube, Instagram, Flickr
Social Sharing and Curation	Pinterest
Content Collaboration Tools	Prezi, Google Drive, Microsoft OneDrive

3.5 Data Collection

Permission to conduct the study was obtained by the Institutional Review Board at University of Central Florida (See Appendix B). Upon proposal approval, invitations to the online survey were sent via email to the prospective participants. Using the Dillman et al. (2014) method for implementing an online or web survey, the researcher prepared an email invitation that includes a link to the online survey, information about the study, what the survey is about, who is conducting the study, and how to contact the researcher if needed (See Appendix C). The email also stated that participation in the study is voluntary, the participants can withdraw from the study at any time, and the data will be kept confidential. The email was sent to the Deanship of Graduate Studies at the targeted university. The Deanship forwarded the email invitation on the behalf of the researcher to the faculty members at the university. Once the participants clicked on the web survey

link, a welcome message and an online informed consent was displayed. The message explained the purpose of the study, how data would be used, and the contact information of the researcher. The message also specified that participation was voluntary and the privacy of the participants would be guaranteed at all times. As an attempt to recruit more participants, the researcher sent follow-up email and individual invitations to the faculty members using the email addresses listed in the university website directory. In the follow-up email, the researcher stated that a survey invitation was sent through the Deanship of Graduate Studies at the university, thanking those who responded, and asking for the participation of the ones who had yet to do so.

3.6 Data Analysis

Data was analyzed using Statistical Package for Social Sciences software (SPSS) and Smart-PLS (Ringle, Wende, & Becker, 2015). Descriptive and inferential statistical methods were used to answer the research questions. In the following sections, brief descriptions of the statistical analyses utilized in this study are presented.

3.6.1. Descriptive Analysis

Descriptive statistical analysis was used to answer the research question pertaining to the Saudi Arabian faculty use of Web 2.0 tools and the faculty perceptions of the educational benefits of using Web 2.0 tools in the classroom. Using SPSS, the researcher determined respondent profiles based on responses from the items in the first section of the survey (background information). In addition, measures of central tendency, frequencies, and percentages of responses to the items in the second section of the survey were examined to determine faculty perceptions of the benefits of using Web 2.0 tools.

3.6.2. The PLS Path Model

For this study, the partial least squares structural equation modeling (PLS-SEM) was chosen for the path analysis. Partial least squares focuses on maximizing the explained variance between latent variable constructs to predict a specific set of hypothesized relationships. PLS-SEM is the method of choice when the primary objective of a study is prediction and explanation of target constructs (Hair, Hult, Ringle, & Sarstedt, 2017). Additionally, PLS-SEM is commonly used for exploratory research analyses that aim to extend existing structural theoretical models and provide high level of statistical power with smaller sample sizes. Moreover, PLS-SEM can easily handle single-item constructs and missing values as long as they are below a reasonable level, and it does not require assumptions of the normality of data distribution (Hair et al., 2017; Reinartz, Haenlein, & Henseler, 2009). Thus, PLS-SEM suited the aim of the present study, which is exploring and predicting factors influencing Saudi Arabian faculty members' intentions to use Web 2.0 tools based on the DTPB. Examining the constructs included in this study and the items or indicators measuring these constructs (Table 1), there are two constructs that are measured using single-item (i.e. facilitating conditions resources and facilitating conditions technology). Moreover, upon examining the collected data, missing values from several items were identified. When the missing values for each recorded response exceeded 25%, that response would be eliminated.

The first step in PLS-SEM approach is to examine the measurement model, which is used to validate the relationships between the constructs and their indicators (outer model). There are two different relationships between the construct and its indicators, reflective measurement and formative measurement. Reflective measurement refers to

indicators that are affected by the same construct; therefore, the causality is from the construct to its measures or indicators. These indicators can be viewed as the representative sample of all the possible items that form the domain of the construct (Ali, Rasoolimanesh, Sarstedt, Ringle, & Ryu, 2017; Hair et al., 2017). On the contrary, formative measurement depicts the impact of the indicators on the construct, in which the causality flows from the indicators to the construct. There is no definite answer on when to use formative measurement or reflective measurement. The construct conceptualization and the purpose of the study usually are used to determine the measurement model. Since the items in the survey used for this study were created to reflect and measure each construct (Ajjan & Hartshorne, 2008), all the constructs included were modeled as reflective measurements (Figure 2).

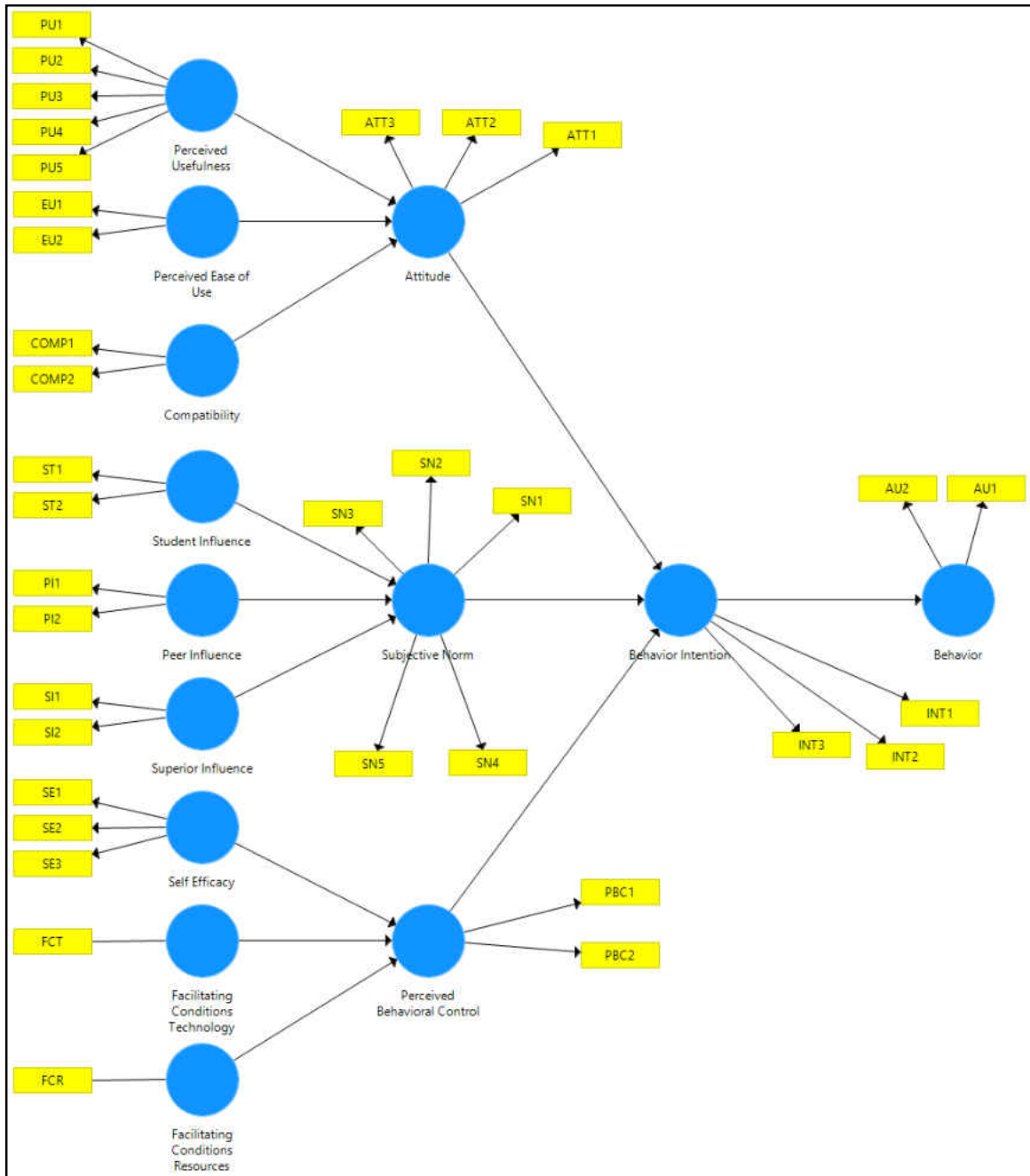


Figure 2. The Reflective Measurement Model for the PLS Path Model

To assess the reflective measurement model indicator, the following standard metrics should be examined: indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. To assess indicator reliability, a threshold value of equal or greater than 0.6 or 0.7 of the indicator's loading is considered

acceptable. Moreover, the Cronbach's Alpha and composite reliability values should be equal or greater than 0.6 or 0.7 are acceptable in exploratory research. To evaluate convergent validity of reflective construct, the average variance extracted (AVE) should be considered. An AVE value of 0.50 or higher indicates that the construct explains more than half of the variance of its indicators. Lastly, the discriminant validity of a construct, which refers to how truly a construct is distinct from other constructs, should be examined. Typically, the discriminant validity is measured by examining the Fornell-Larcker criterion, cross-loadings, and the Heterotrait-monotrait (HTMT). In terms of the Fornell-Larcker criterion, the square root of AVE (diagonal value) for each construct should be greater than its highest correlation with any other construct. In terms of the cross-loadings, the loading of each indicator should be higher than the loadings of its corresponding constructs' indicators. With regard of HTMT, a value of less than 0.85 should be confirmed. For reflective measurement models, when assessing the discriminant validity using HTMT is not established, usually researchers will continue to examine the Fornell-Larcker criterion and the cross-loadings. If these measures are met, then the discriminant validity of the model is established and researchers can continue with the analysis (Hair et al., 2017).

Once the reliability and the validity of the constructs in the measurement model were confirmed, the structural model was assessed to identify the relationships between the constructs (inner model) as hypothesized in the study. To evaluate the structural model, R^2 value and the path coefficients are the essential measures. The significant of path coefficients was examined by running bootstrapping procedure. A bootstrapping is a nonparametric method used to assess the significant level of partial least square

estimates. If the t -value is greater than 1.96 and p -value is less than the significant level (5%), the hypothesis will be supported (Hair et al., 2017). All the aforementioned criteria were applied to assess the measurement and structural models.

Description of the Path Analysis Variables

The variables that were examined in the path analysis of this study based on the DTPB can be illustrated as the following:

- **Behavioral intention** which is concerned with the motivational factors that influence taking a specific action (Ajzen, 1991). In the context of this study, behavioral intention of Saudi Arabian faculty to use Web 2.0 tools is expected to positively affect the actual use of Web 2.0 tools.
- **Attitude**, which refers to the extent in which an individual favors a certain behavior. Past literature has shown a positive relationship between attitude and behavioral intention (Ajjan & Hartshorne, 2008; Sadaf et al., 2013). In the context of this study, Saudi Arabian faculty's attitude is expected to positively influence the behavioral intentions. Attitude is decomposed into three components:
 - *Perceived usefulness*, which in this study refers to the extent to which Saudi Arabian faculty members believe that using Web 2.0 will improve their effectiveness in the classroom.
 - *Perceived ease of use*, which in this study refers to the extent to which Saudi Arabian faculty members believe that using Web 2.0 will be free of effort.
 - *Compatibility*, which in this study refers to the extent to which Saudi Arabian faculty members believe that using Web 2.0 will be compatible with their job responsibilities.

- **Subjective norms**, which are concerned with how an individual's behavior is affected by the different social groups in his or her circle. In the context of this study, a positive relationship between subjective norms and Saudi Arabian faculty intention to use Web 2.0 tools is hypothesized. Subjective norms in this study include:
 - *Peer influence* to use Web 2.0 tools positively affects subjective norms of Saudi Arabian faculty.
 - *Superior influence* to use Web 2.0 tools positively affects subjective norms of Saudi Arabian faculty.
 - *Student influence* to use Web 2.0 tools positively affects subjective norms of Saudi Arabian faculty.

- **Perceived behavioral control**, which refers to the perception of an individual on how much control he or she has over a certain behavior. In the context of this study, perceived behavioral control reflects the Saudi Arabian belief in their ability to use Web 2.0 tools. Three components included in this construct:
 - *Self-efficacy*, which in this study refers to Saudi Arabian faculty judgment of their ability to use Web 2.0 tools in teaching.
 - *Facilitating resource conditions*, which in this study refers to the availability resource for Saudi Arabian faculty members to use Web 2.0 tools.
 - *Facilitating technology conditions*, which in this study refers to the availability of compatible technology for Saudi Arabian faculty members to use Web 2.0 tools.

3.7 Summary

By adding Web 2.0 tools to the classroom instruction, faculty can create a collaborative, social, and active learning experience for students. A better understanding of the factors that influence faculty use of Web 2.0 tools in higher education might help improve the implementation of these tools in teaching and learning, in turn improving the quality of education. Thus, the purpose of this study is to explore the Saudi Arabian faculty perceptions and use of Web 2.0 tools in Saudi Arabian higher education. This chapter provided a detailed description of the research methodology that was implemented in this study. It provided information regarding the research design, research sampling, data collection procedures, and data analysis. Chapter 4 will provide the results of the statistical analyses that have been conducted to answer the research questions of this study.

CHAPTER 4: RESULTS

4.1 Introduction

The purpose of this study was to determine factors that influence Saudi Arabian faculty members' intentions to use Web 2.0 tools in their future classrooms and to explore faculty members' perceptions of the educational benefits of using Web 2.0 tools. This chapter discusses the statistical analyses of the collected data in the study. The results of the descriptive statistics are presented to examine the participant's demographics and their perceptions of the educational benefits of Web 2.0 tools. The results of the path model are presented according to the research hypotheses.

4.2 Research Questions

This study is designed to explore the following questions:

Research Question 1: What are the Saudi Arabian faculty perceptions of the benefits of using Web 2.0 tools to supplement the traditional classroom instruction?

Research Question 2: What factors best predict Saudi Arabian faculty intentions to adopt and use Web 2.0 tools in their future classroom to supplement classroom instruction?

4.3 Research Hypotheses

To answer the above questions, the decomposed theory of planned behavior was be used to examine and understand perceptions and future intentions to use Web 2.0 tools in classroom teaching among the higher education faculty at one of the largest public university in Saudi Arabia. Based on the above questions, and the review of previous literature related to this topic, the researcher developed the following alternative hypotheses:

H1: Saudi Arabian faculty behavioral intention to use Web 2.0 tools positively affects behavior.

H2: Attitude of Saudi Arabian faculty members towards using Web 2.0 tools positively affects behavioral intentions:

- a. Perceived usefulness positively affects attitudes to use Web 2.0 tools;
- b. Perceived ease of use positively affects attitudes to use Web 2.0 tools;
- c. Perceived compatibility positively affects attitudes to use Web 2.0 tools.

H3: Subjective norms of Saudi Arabian faculty members in regard to using Web 2.0 tools positively affect behavioral intentions:

- a. Superior influence to use Web 2.0 tools positively affects the subjective norms of Saudi Arabian faculty;
- b. Peer influence to use Web 2.0 tools positively affects the subjective norms of Saudi Arabian faculty;
- c. Student influence to use Web 2.0 tools positively affects the subjective norms of Saudi Arabian faculty.

H4: Perceived behavioral control of Saudi Arabian faculty members in regard to using Web 2.0 tools positively affects behavioral intentions:

- a. Saudi Arabian faculty self-efficacy of using Web 2.0 tools positively affects perceived behavioral control;
- b. Facilitating technologies' conditions positively affects Saudi Arabian faculty perceived behavioral control;
- c. Facilitating resources' conditions positively affects Saudi Arabian faculty perceived behavioral control.

4.4 Descriptive Statistics

4.4.1 Participants

The participants in this study consisted of Saudi Arabian faculty members who were currently teaching at a university located in the city of Jeddah in the Western region of the Kingdom of Saudi Arabia. An invitation to complete the *Saudi Faculty Perceptions and Use of Web 2.0 Tools* web survey was emailed to the entire faculty at that university through its Deanship of Graduate studies. The survey was available from September 8th, 2018 until October 15th, 2018. The response rate was fairly low (about 52 responses out of 5,497) from the first invitation. The researcher sent subsequent follow-up emails using the web directory of the university. The data was first assessed for completeness and correctness prior to analysis using the PLS-SEM approach. The data should be removed if it has more than 25 % missing data (Sekaran, 2005). A total of 136 participants completed at least part of the survey. Once all partial survey responses were removed, the total number of survey respondents who were included in the study was 103. Table 3 provides a summary of the participants demographics.

Table 3. Profile of Respondents

Variable	Value	Frequency	Percentage
Gender	Male	34	33
	Female	69	67
Age	Under 30 years	9	8.7
	31 – 39 years	68	66
	40 – 49 years	19	18.4
	50 – 59 years	7	6.8
Role at university	Lecturer/Visiting professor	36	35
	Assistant Professor	44	42.7
	Associated Professor	8	7.8
	Professor	4	3.9
	Graduate Student/Teaching Assistant	11	10.7
Years of teaching	1 – 5 years	48	46.6
	6 – 10 years	32	31.1
	11 – 15 years	12	11.7
	16 – 20 years	5	4.9
	21 years or more	6	5.8

The respondent group consisted of 34 males (33%) and 69 females (67%). The majority of the participants, 68 (66%), were between 31 and 39 years of age, followed by 19 (18.4%) were between 40 and 49 years of age, nine participants (8.7%) were under 30 years, and 7 (6.8%) were between 50 and 59 years of age. The role and rank of the participants at the university included, 44 (42.7%) were assistant professors, 36 (35%) were lecturers, 11 (10.7%) were teaching assistants, 8 (7.8%) were associated professors, and 4 (3.9%) were professors. These results clearly demonstrate that there was a difference in terms of the respondent gender and position. Nearly, female respondents were double the number of the male respondents. This observation can be explained by the fact that there are more female faculty members than male faculty members at that university (Table 4). Moreover, the number of lecturers and assistant professors respondents was the highest among all the participants. This observation can be explained

by examining the total number of Saudi Arabian faculty members at that university (Table 4).

Table 4. Total Number of Saudi Arabian Faculty at the University ("Higher education statistics," 2017)

	Teaching Assistant	Lecturer	Assistant Professor	Associated Professor	Professor	Other	Total
Male	947	331	534	236	219	10	2,277
Female	1,305	953	610	212	71	69	3,220
Total	2,252	1,284	1,144	448	290	79	5,497

Among the participants for this study, 31 were from College of Computer Science (30.1%), 21 were from College of Engineering (20.4%), 11 were from College of Education (10.7%), 11 were from College of Communication and Media (10.7%), 8 were from College of Applied Sciences (7.8%), 6 were from College of Arts and Humanities (5.8%), 4 were from English Language Institute (3.9%), 4 were from Economic and Administration (3.9%), 2 were from College of Pharmacy (1.9%), and one participant from each of the following Colleges: Health Services and Hospitals Administration, Maritime Studies, Medicine, Nursing, and Art and Design. Further, the majority of the participants (46.6%) had been teaching for 1 to 5 years, 32 (31.1%) had been teaching for 6 to 10 years, 12 (11.7%) had been teaching for 11 to 15 years, 6 (5.8%) had been teaching for 21 years or more, and 5 (4.9%) had been teaching for 16 to 20 years (Table 3).

4.4.2 Faculty Use and Perceptions of Web 2.0 Tools

Participants rated the use of Web 2.0 tools in relationship to certain academic tasks and the types of tools that could be used to complete these tasks. The results

demonstrated the level to which Saudi Arabian faculty viewed the use of different Web 2.0 tools could provide their students with some educational benefits (Table 5). In terms of improving students learning: about 49.5% of the participants viewed Audio and Video conferencing tools would, about 43% of the participants viewed the use of Social Networking Sites would, about 39% of the participants viewed that Wikis would, about 33% of the participants viewed that Blogs would, and about 19% of the participants viewed that Instant Messaging tools would help in improving students learning. In terms of improving students' grades: about 45% of the participants felt that the use of Audio and Video Conferencing tools would, about 40% of the participants felt that Instant Messaging tools would, about 32% of the participants felt that Social Networking Sites would, about 31% of the participants felt that Blogs would, and about 29% of the participants felt that Wikis would improve students' grades. In terms of improving students' satisfaction with the course: about 63% of the participants viewed Social Networking Sites would be useful, about 52% of the participants viewed that Instant Messaging would, about 36% viewed that Audio and Video Conferencing would, and Blogs and Wikis were viewed as the least useful Web 2.0 applications to improve students' satisfaction with the course (23%).

Table 5. Saudi Arabian Faculty Perceptions of the Educational Benefits of Web 2.0 Tools

	Blogs	Wikis	Social Networking	Instant Messaging	Audio/Video Conferencing
Improve student-faculty interaction	12.6%	13.5%	67.9%	63.1%	35.9%
Improve students' learning	33%	39.8%	43.7%	19.4%	49.5%
Improve students' satisfaction with the course	23.3%	23.3%	63.1%	52.4%	36.8%
Improve student-student interaction	28.1%	14.5%	76.6%	66%	24.2%
It could be easily integrated into my course	29.1%	29.1%	57.2%	33.9%	35.9%
It could be effectively integrated into my course	27.1%	22.3%	46.6%	36.8%	40.7%
Improve students' grades	31%	29.1%	32%	40.7%	45.6%
Improve students' writing ability	59.2%	37.8%	43.6%	37.8%	18.4%

About 67% of the respondents indicated that Social Networking Sites could improve the interaction between students and faculty. Whereas, 63% of the respondents

expressed Instant Messaging could improve students and faculty interactions. And finally, 35% of the respondents felt that Audio/Video Conferencing could improve students and faculty interactions. Wikis and Blogs were the least recognized applications in terms of increasing the interaction between students and faculty (13% and 12% respectively). Regarding improving student-to-student interaction, about 76% of the participants viewed Social Networking Sites useful for student-to-student interaction while 66% viewed Instant Messaging as beneficial. Other Web 2.0 applications were deemed less likely to improve student-to-student interaction. For instance, 28% of the participants viewed Blogs, about 24% of the participants considered Audio and Video conferencing, and 14% of the respondents thought Wikis would improve student-to-student interactions.

In terms of improving students' writing ability, about 59% viewed Blogs would be the most beneficial for that purpose followed by Social Networking Sites (43%), about 37% of the participants viewed Wikis and Instant Messaging would, and about 18% of the participants viewed Audio and Video conferencing tools useful for improving writing skills. Further, participants viewed Social Networking Sites could be the most easily integrated and effectively integrated Web 2.0 application into their courses (57% and 46%), followed by Audio and Video Conferencing tools (35% and 40%), Instant Messaging (33% and 36%), Blogs (29% and 27%), and Wikis (29% and 22%).

Table 6. Measures of Central Tendency for Saudi Arabian Faculty Use of Web 2.0

		Blogs Usage	Wikis Usage	SNS Usage	IM Usage	Media Sharing Usage	Audio/Video Conferencing	Social Sharing Usage	Content Collaboration Usage
N	Valid	101	102	102	101	102	102	99	103
	Missing	2	1	1	2	1	1	4	0
	Mode	1	3	1	5	5	1	1	4
	Range	4	4	5	5	5	5	5	5
	Minimum	1	1	0	0	0	0	0	0
	Maximum	5	5	5	5	5	5	5	5

Note: the corresponding values for the Mode: 0 = NA, 1 = Don't use and don't plan to use, 2 = Don't use but plan to, 3 = Use occasionally, 4 = Use frequently, and 5 = Always use.

Measures of central tendency (Table 6) were computed to summarize data for the participants' use or intentions to use some Web 2.0 tools (Harpe, 2015). The results showed that the majority of the participants reported that they did not use and not plan to use the following Web 2.0 tools in their future classroom: Blogs, Social Networking Sites, Audio and Video conferencing, and social sharing tools. In terms of the participants' use or intention to use Instant Messaging tools and Media Sharing tools, the results showed that the majority of the participants reported that they always use these tools in their courses. In addition, the results showed that the majority of the participants reported using Wikis occasionally in their courses. Lastly, the results showed that the majority of the participants reported that they frequently use content collaboration tools in their courses. Table 7 breaks down the results in percentages for the participants' use of Web 2.0 tools.

Table 7. Saudi Arabian Faculty Use of Web 2.0 Tools

	NA	Don't use and don't plan to use	Don't use but plan to use	Use occasionally	Use frequently	Always use
Blogs	0	42.7%	30.1%	18.4%	5.8%	1%
Wikis	0	28.2%	22.3%	29.1%	13.6%	5.8%
Social Networking	1%	22.3%	18.4%	20.4%	21.4%	15.5%
Instant Messaging	1%	16.5%	3.9%	16.5%	17.5%	42.7%
Media Sharing	1%	10.7%	14.6%	24.3%	23.3%	25.2%
Audio/Video Conferencing	1.9%	32%	17.5%	28.82%	10.7%	8.7%
Social Sharing	1.9%	42.7%	22.3%	21.4%	2.9%	4.9%
Content Collaboration	1%	3.9%	10.7%	24.3%	33%	27.2%

The faculty level of comfort with Web 2.0 tools might partially explain the respondents' perceptions and intentions to use of some of Web 2.0 tools (Table 8). For example, 54% have never used Blogs, 35% have never used Social Sharing tools, and 14% have never used Wikis. The perceived proficiency level of Web 2.0 tools included in the study was as follow: a) 73% of the respondents felt they were proficient using Instant Messaging tools; b) 45% felt proficient using Media Sharing tools; and c) 42% felt proficient using Social Networking Sites. Figure 3 depicts the respondents' perceptions on how easily Web 2.0 tools can be integrated in their classroom compared to their level of expertise and usage of the tools. This result shows that there is some discrepancy between faculty perceptions of how Web 2.0 tools can be easily integrated into instruction regardless how experienced they are in using these tools.

Table 8. Saudi Arabian Faculty Level of Comfort with Web 2.0 Tools

	Never Use	Novice	Competent	Proficient
Blogs	54.4%	23.3%	14.6%	7.8%
Wikis	14.6%	24.3%	45.6%	15.5%
Social Networking	3.9%	5.8%	47.6%	42.7%
Instant Messaging	0	1.9%	24.3%	73.8%
Media Sharing	1.9%	8.7%	43.7%	45.6%
Audio/Video Conferencing	6.8%	20.4%	41.7%	31.1%
Social Sharing	35.9%	27.2%	20.4%	16.5%
Content Collaboration	3.9%	17.5%	44.7%	34%

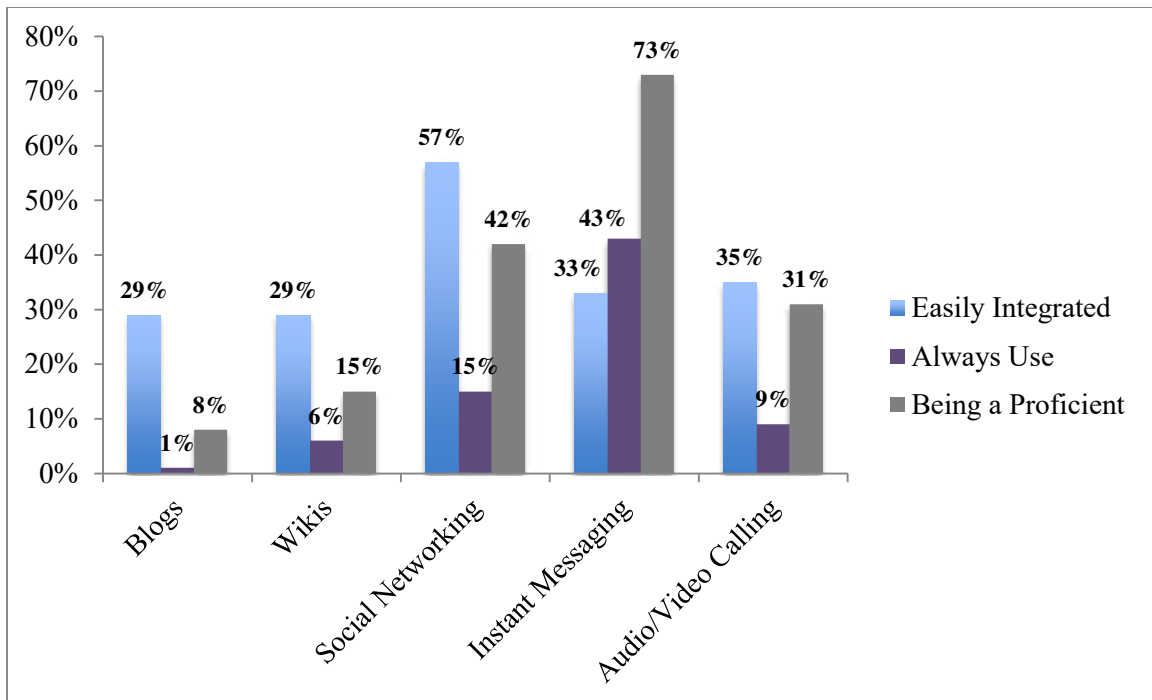


Figure 3. Faculty Perceptions of Ease of Use of Web 2.0 Compared to their Expertise and Usage

Respondents were asked about their perceptions of assigning Web 2.0 technologies to demonstrate knowledge. The list of assignment types included were (according to Bloom's Taxonomy cognitive level):

- **Knowledge retention:** listing, recalling, outlining, and ordering information.
- **Comprehension:** separating, classifying, googling, bookmarking, comparing, and finding information.
- **Application:** applying, illustrating, producing, editing, and solving information.
- **Analysis:** explaining, paraphrasing, and discussing information.
- **Synthesis:** designing, producing, creating, inventing, publishing, and composing information.
- **Evaluation:** investigating, hypothesizing, commenting, posting, and contrasting information.

Reviewing the results related to the types of cognitive levels employed for assignments that use Web 2.0 tools indicated that the majority of the participants either agree or strongly agree to assign Web 2.0 tools in all of the six categories of the assignment types included in the survey (Figure 4). Out of the six categories of Bloom's Taxonomy cognitive level, assignments that demonstrate information application and information analysis were the most considered types of assignment. For assignments that are concerned with listing or recalling information (knowledge retention), 14% and 56% of the participants strongly agreed or agreed respectively on using Web 2.0 tools to complete the task. When assigning Web 2.0 tools for classifying, searching, and comparing information (comprehension), 26% and 58% of participants either strongly agreed or agreed to make students use Web 2.0 tools to complete the task. In reference to applying information or solving problems (information application), the results indicated that 18% and 62% of the participants strongly agreed or agreed to make students use Web 2.0 tools to complete the task.

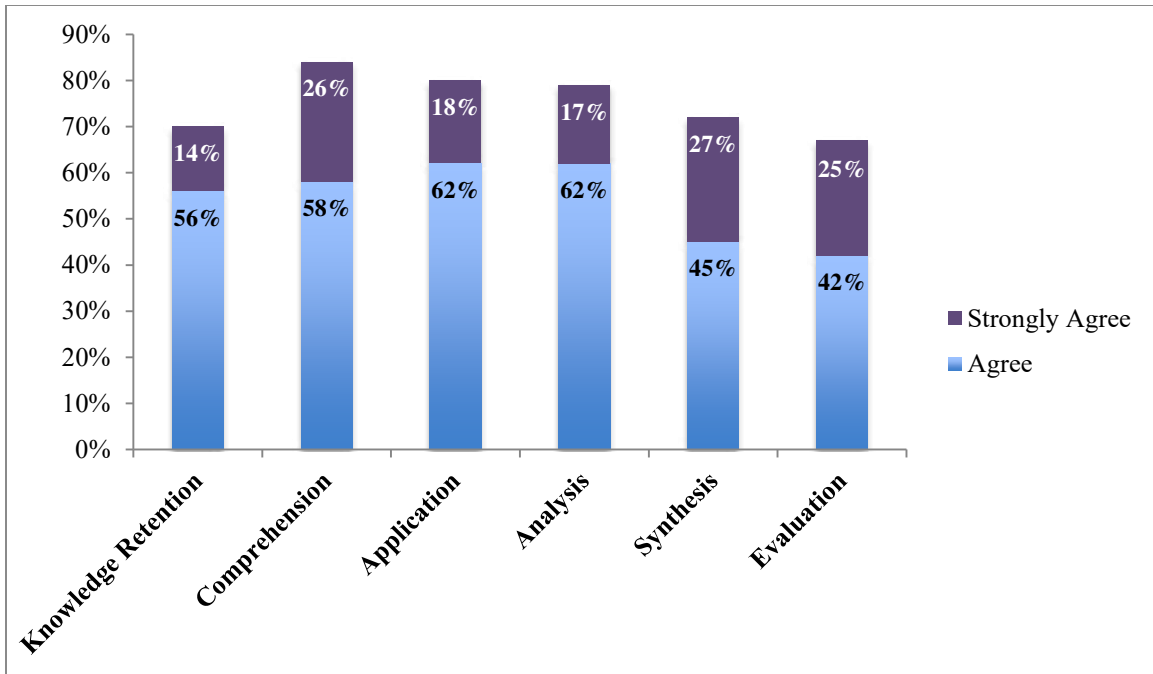


Figure 4. Faculty Perceptions of Assigning Web 2.0 Tools to Demonstrate Knowledge

Reviewing the results of faculty perceptions of assigning Web 2.0 tools for students to complete, explain, paraphrasing, and discussing information (information analysis) indicated that 17% and 62% of the participants strongly agreed or agreed to use Web 2.0 tools. The results from faculty perceptions of assigning Web 2.0 tools for students to use when designing, producing, or publishing information (synthesis) indicated that 27% and 45% of the participants strongly agreed and agreed to incorporate Web 2.0 tools to complete that task. Lastly, results indicated that 25% and 42% of the participants strongly agreed or agreed to assign Web 2.0 tools to complete a task that involves the student to investigate, hypothesize, and contrast information (evaluation).

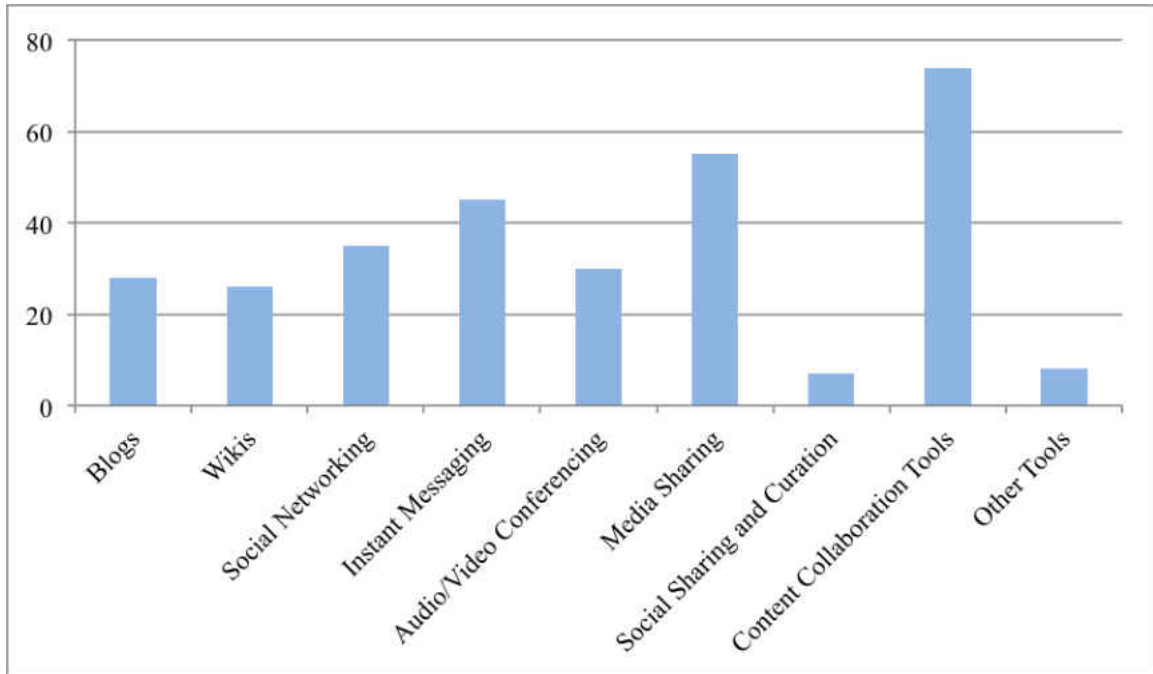


Figure 5. Saudi Arabian Faculty Intentions to Use Web 2.0 Tools in Future Classrooms

The results indicated that most of the participants intended to use Web 2.0 tools in their future classrooms (Figure 5). Of all the Web 2.0 tools listed in the survey (

Table 9), the content collaboration tools option (e.g. Google Drive and Microsoft OneDrive) was the most selected Web 2.0 tool ($n = 74$) in terms of participants' intention to use in their future classrooms. Media sharing tools (e.g. YouTube and Instagram) was the second most selected option on the list ($n = 55$) when it comes to participants' intention to use in their future classrooms.

Table 9. Most Frequently Used or Might Use Web 2.0 Tools by Saudi Arabian Faculty

Web 2.0 Tool	Frequency
Blogs	28
Wikis	26
Social Networking	35
Instant Messaging	45
Audio/Video Conferencing	30
Media Sharing	55
Social Sharing and Curation	7
Content Collaboration Tools	74
Other Tools	8

The descriptive results indicated a lack of experience with some of the Web 2.0 tools included in this study as illustrated by their comfort level with some Web 2.0 tools. Thus, a further examination of Saudi Arabian faculty decision to adopt and use Web 2.0 tools was warranted. In order to better understand factors influencing Saudi Arabian faculty decision to adopt and use Web 2.0 tools, data was analyzed using the DTPB.

4.5 Factors Influencing Saudi Arabian Faculty’s Intentions to Use Web 2.0

Tools

This section will discuss the results based on the PLS-SEM approach, which has examined the hypothesized relationships in this study. The PLS-SEM approach was selected for to the following reasons:

- The study focuses on predicting and explaining the variance in the targeted constructs relating to DTPB.
- The PLS-SEM approach enables researchers to create and estimate model with minimum restrictions in regards to measurement scales, sample size, and data distributions.

Examining the results from the PLS-SEM began with the assessment of the measurement model, followed by the structural model.

4.5.1 Measurement Model Assessment

In order to measure the reliability of each indicator, the factor loading should be considered. A value of equal or greater than 0.6 or 0.7 for each indicator's loading is considered as reliable (Hair et al., 2017). Moreover, the Cronbach's Alpha and composite reliability values should be equal or greater than 0.6 for exploratory research. Based on the results from PLS-SEM, all the indicators are reliable and satisfy the aforementioned criteria (Table 10). Further, the average variance extracted (AVE) is the common measure for establishing the convergent validity, which should be a value of 0.5 or greater. As shown in Table 10, the value of AVE for all the constructs is greater than 0.5, therefore, the constructs' convergent validity is established.

In order to establish the discriminant validity, HTMT, Fornell-Larcker criterion, and cross-loadings should be examined. In terms of HTMT, a value of less than 0.85 should be confirmed. As shown in Table 11, HTMT is not confirmed. However, discriminant validity can still be established by examining Fornell-Larcker criterion and the cross-loadings (Hair et al., 2017). The results from the aforementioned analyses

showed that the specified criterion is met (Table 12, Table 13). Thus, the discriminant validity is established.

Table 10. Measurement Model Results

Constructs	Indicator s	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Behavior	AU1	0.908	0.797	0.908	0.690
	AU2	0.916			
Behavior Intention	INT1	0.895	0.900	0.938	0.834
	INT2	0.933			
	INT3	0.911			
Attitude	ATT1	0.873	0.777	0.870	0.690
	ATT2	0.771			
	ATT3	0.846			
Perceived Ease of Use	EU1	0.922	0.720	0.874	0.777
	EU2	0.838			
Perceived Usefulness	PU1	0.859	0.878	0.911	0.672
	PU2	0.826			
	PU3	0.829			
	PU4	0.816			
	PU5	0.765			
Compatibility	COMP1	0.948	0.893	0.949	0.903
	COMP2	0.953			
Subjective Norms	SN1	0.882	0.914	0.936	0.746
	SN2	0.872			
	SN3	0.811			
	SN4	0.846			
	SN5	0.903			
Student Influence	ST1	0.991	0.982	0.991	0.983
	ST2	0.991			
Peer Influence	PI1	0.964	0.919	0.961	0.925
	PI2	0.960			
Superior Influence	SI1	0.985	0.969	0.985	0.970
	SI2	0.985			
Perceived Behavioral Control	PBC1	0.805	0.628	0.841	0.726
	PBC2	0.896			
Self-Efficacy	SE1	0.914	0.890	0.932	0.820
	SE2	0.920			
	SE3	0.882			
Facilitating Conditions Resources	FCR	1.0	1.0	1.0	1.0
Facilitating Conditions Technology	FCT	1.0	1.0	1.0	1.0

Table 11. Heterotrait-Monotrait Ratio (HTMT) Results

	A	B	BI	COMP	FCR	FCT	PI	PBC	EU	PU	SE	ST	SN	SI
A														
B	0.667													
BI	0.796	0.476												
COMP	0.652	0.328	0.519											
FCR	0.312	0.178	0.310	0.615										
FCT	0.175	0.138	0.190	0.578	0.580									
PI	0.343	0.107	0.480	0.221	0.074	0.077								
PBC	0.447	0.517	0.416	0.493	0.530	0.412	0.137							
EU	0.736	0.606	0.770	0.516	0.369	0.342	0.295	0.592						
PU	0.858	0.425	0.833	0.612	0.398	0.271	0.389	0.423	0.810					
SE	0.458	0.396	0.396	0.751	0.744	0.570	0.091	0.788	0.416	0.454				
ST	0.225	0.044	0.414	0.191	0.048	0.078	0.929	0.019	0.187	0.340	0.069			
SN	0.325	0.170	0.535	0.210	0.120	0.099	0.789	0.317	0.403	0.457	0.119	0.716		
SI	0.233	0.038	0.413	0.276	0.137	0.177	0.899	0.099	0.242	0.360	0.133	0.949	0.746	

A=Attitude, B=Behavior, BI=Behavioral Intention, COMP=Compatibility, FCR=Facilitating Conditions Resources, FCT=Facilitating Conditions Technology, PI=Peer Influence, PBC=Perceived Behavioral Control, EU=Perceived Ease of Use, PU=Perceived Usefulness, SE=Self-Efficacy, ST=Student Influence, SN=Subjective Norm, SI=Superior Influence.

Table 12. Fornell-Larcker Criterion Results

	A	B	BI	COMP	FCR	FCT	PI	PBC	EU	PU	SE	ST	SN	SI
A	0.831													
B	0.520	0.912												
BI	0.680	0.405	0.913											
COMP	0.542	0.277	0.467	0.950										
FCR	0.279	0.159	0.293	0.581	1.000									
FCT	0.151	0.122	0.180	0.545	0.580	1.000								
PI	0.293	0.093	0.437	0.200	0.070	0.074	0.962							
PBC	0.302	0.360	0.307	0.373	0.441	0.332	0.102	0.852						
EU	0.570	0.449	0.626	0.416	0.316	0.282	0.237	0.402	0.881					
PU	0.726	0.365	0.749	0.545	0.377	0.249	0.354	0.315	0.663	0.820				
SE	0.386	0.333	0.354	0.670	0.703	0.537	0.083	0.606	0.341	0.407	0.906			
ST	0.204	0.000	0.389	0.179	0.048	0.077	0.883	0.001	0.158	0.319	0.065	0.991		
SN	0.281	0.145	0.486	0.190	0.113	0.093	0.728	0.230	0.326	0.416	0.102	0.680	0.864	
SI	0.210	0.025	0.385	0.256	0.134	0.174	0.848	0.081	0.203	0.336	0.125	0.926	0.703	0.985

A=Attitude, B=Behavior, BI=Behavioral Intention, COMP=Compatibility, FCR=Facilitating Conditions Resources, FCT=Facilitating Conditions Technology, PI=Peer Influence, PBC=Perceived Behavioral Control, EU=Perceived Ease of Use, PU=Perceived Usefulness, SE=Self-Efficacy, ST=Student Influence, SN=Subjective Norm, SI=Superior Influence.

Table 13. Cross-Loadings Results

	A	B	BI	COMP	FCR	FCT	PI	PBC	EU	PU	SE	ST	SN	SI
ATT1	0.873	0.421	0.700	0.475	0.259	0.112	0.268	0.243	0.541	0.655	0.380	0.213	0.292	0.230
ATT2	0.771	0.478	0.452	0.474	0.168	0.150	0.190	0.265	0.407	0.516	0.285	0.059	0.170	0.075
ATT3	0.846	0.409	0.512	0.406	0.260	0.121	0.265	0.251	0.458	0.626	0.285	0.218	0.223	0.198
AU1	0.495	0.908	0.361	0.253	0.150	0.142	0.067	0.282	0.386	0.323	0.293	-0.036	0.135	-0.009
AU2	0.453	0.916	0.377	0.251	0.140	0.083	0.102	0.373	0.431	0.342	0.314	0.035	0.129	0.053
COMP1	0.502	0.275	0.413	0.948	0.538	0.574	0.205	0.344	0.357	0.495	0.609	0.169	0.160	0.273
COMP2	0.527	0.251	0.473	0.953	0.567	0.465	0.176	0.364	0.432	0.541	0.664	0.171	0.201	0.214
EU1	0.575	0.358	0.593	0.382	0.299	0.218	0.196	0.366	0.922	0.655	0.340	0.147	0.287	0.188
EU2	0.407	0.454	0.503	0.351	0.253	0.295	0.230	0.343	0.838	0.493	0.250	0.132	0.293	0.169
FCR	0.279	0.159	0.293	0.581	1.000	0.580	0.070	0.441	0.316	0.377	0.703	0.048	0.113	0.134
FCT	0.151	0.122	0.180	0.545	0.580	1.000	0.074	0.332	0.282	0.249	0.537	0.077	0.093	0.174
INT1	0.672	0.425	0.895	0.426	0.216	0.134	0.394	0.254	0.573	0.692	0.288	0.339	0.366	0.308
INT2	0.572	0.371	0.933	0.397	0.294	0.163	0.402	0.312	0.572	0.676	0.330	0.366	0.487	0.367
INT3	0.616	0.308	0.911	0.454	0.296	0.198	0.401	0.275	0.570	0.684	0.352	0.362	0.482	0.383
PBC1	0.298	0.345	0.292	0.288	0.227	0.240	0.097	0.805	0.308	0.276	0.403	0.000	0.249	0.042
PBC2	0.229	0.282	0.241	0.343	0.490	0.318	0.081	0.896	0.372	0.265	0.607	0.001	0.159	0.090
PI1	0.280	0.110	0.442	0.202	0.056	0.072	0.964	0.094	0.259	0.343	0.069	0.860	0.718	0.815
PI2	0.284	0.067	0.398	0.182	0.080	0.070	0.960	0.103	0.195	0.339	0.091	0.838	0.680	0.816
PU1	0.686	0.362	0.704	0.418	0.258	0.116	0.354	0.227	0.618	0.859	0.278	0.337	0.406	0.360
PU2	0.576	0.274	0.642	0.384	0.328	0.159	0.285	0.208	0.531	0.826	0.346	0.283	0.307	0.289
PU3	0.543	0.289	0.513	0.428	0.250	0.192	0.304	0.189	0.494	0.829	0.296	0.291	0.283	0.289
PU4	0.475	0.200	0.567	0.436	0.265	0.298	0.223	0.284	0.524	0.816	0.256	0.203	0.307	0.228
PU5	0.645	0.335	0.612	0.558	0.427	0.278	0.266	0.373	0.529	0.765	0.471	0.182	0.377	0.195
SE1	0.419	0.306	0.333	0.664	0.666	0.461	0.060	0.573	0.351	0.419	0.914	0.063	0.139	0.145
SE2	0.378	0.338	0.336	0.663	0.638	0.526	0.037	0.518	0.332	0.405	0.920	0.021	0.005	0.055
SE3	0.250	0.262	0.291	0.495	0.604	0.475	0.126	0.552	0.242	0.283	0.882	0.091	0.126	0.136

	A	B	BI	COMP	FCR	FCT	PI	PBC	EU	PU	SE	ST	SN	SI
SI1	0.187	0.021	0.368	0.242	0.128	0.164	0.851	0.084	0.171	0.312	0.113	0.923	0.694	0.985
SI2	0.227	0.028	0.391	0.261	0.137	0.179	0.819	0.076	0.228	0.349	0.134	0.902	0.691	0.985
SN1	0.266	0.113	0.453	0.147	0.035	0.021	0.742	0.120	0.288	0.360	0.064	0.641	0.882	0.623
SN2	0.309	0.130	0.444	0.205	0.177	0.076	0.599	0.298	0.370	0.416	0.136	0.574	0.872	0.598
SN3	0.376	0.239	0.487	0.205	0.089	0.082	0.576	0.137	0.254	0.417	0.062	0.509	0.811	0.503
SN4	0.085	0.052	0.357	0.130	0.122	0.144	0.613	0.250	0.280	0.278	0.105	0.599	0.846	0.686
SN5	0.172	0.093	0.349	0.136	0.072	0.087	0.594	0.195	0.208	0.323	0.075	0.606	0.903	0.621
ST1	0.191	-0.026	0.390	0.197	0.076	0.094	0.876	0.017	0.150	0.321	0.075	0.991	0.677	0.926
ST2	0.213	0.027	0.381	0.157	0.019	0.058	0.875	-0.015	0.164	0.313	0.054	0.991	0.672	0.910

A=Attitude, B=Behavior, BI=Behavioral Intention, COMP=Compatibility, FCR=Facilitating Conditions Resources, FCT=Facilitating Conditions Technology, PI=Peer Influence, PBC=Perceived Behavioral Control, EU=Perceived Ease of Use, PU=Perceived Usefulness, SE=Self-Efficacy, ST=Student Influence, SN=Subjective Norm, SI=Superior Influence.

4.5.2 Structural Model Assessment

Once the constructs were confirmed to be both reliable and valid, the structural model was assessed to identify the relationships between the constructs as hypothesized. As indicated in the previous chapter, both R^2 and path coefficients are crucial to indicate how well the analyzed data support the research hypotheses. In terms of the PLS path model assessment, Figure 6 and Table 14 demonstrate the path coefficients and p -values for each hypothesis. In the following sections, the results from the path model will be discussed in regard to each research hypothesis.

Behavior

Research hypothesis H1 stated that Saudi Arabian faculty members' behavioral intention to use Web 2.0 tools positively affects behavior. The path model results indicated behavioral intention ($\beta = 0.405$, $t = 4.623$) had a significant effect on actual behavior. The behavior equation addresses only 16.4% of the variance (R^2). Thus, the research hypothesis H1 is supported.

Behavioral Intention

The research hypotheses pertaining to the behavioral intention construct are as follow:

- H2: Attitude of Saudi Arabian faculty towards using Web 2.0 tools positively affects behavioral intention.
- H3: Subjective norms of Saudi Arabian faculty in regard to using Web 2.0 tools positively affect behavioral intention.

- H4: Perceived behavioral control of Saudi Arabian faculty in regard to using Web 2.0 tools positively affects behavioral intention.

The PLS-SEM results confirmed each of the three factors combined, attitude, subjective norm, and perceived behavioral control, explained a significant variance (56.1%) in behavioral intention (R^2). The path analysis results indicated that attitude ($\beta = 0.575$, $t = 7.274$) and subjective norm ($\beta = 0.310$, $t = 2.934$) had very significant effects on behavioral intention, with attitude having the greatest effect. Therefore, research hypotheses H2 and H3 are supported. However, the results indicated that perceived behavioral control ($\beta = 0.062$, $t = 0.770$) did not have any significant effect on behavioral intention. Thus, the research hypothesis H4 is not supported.

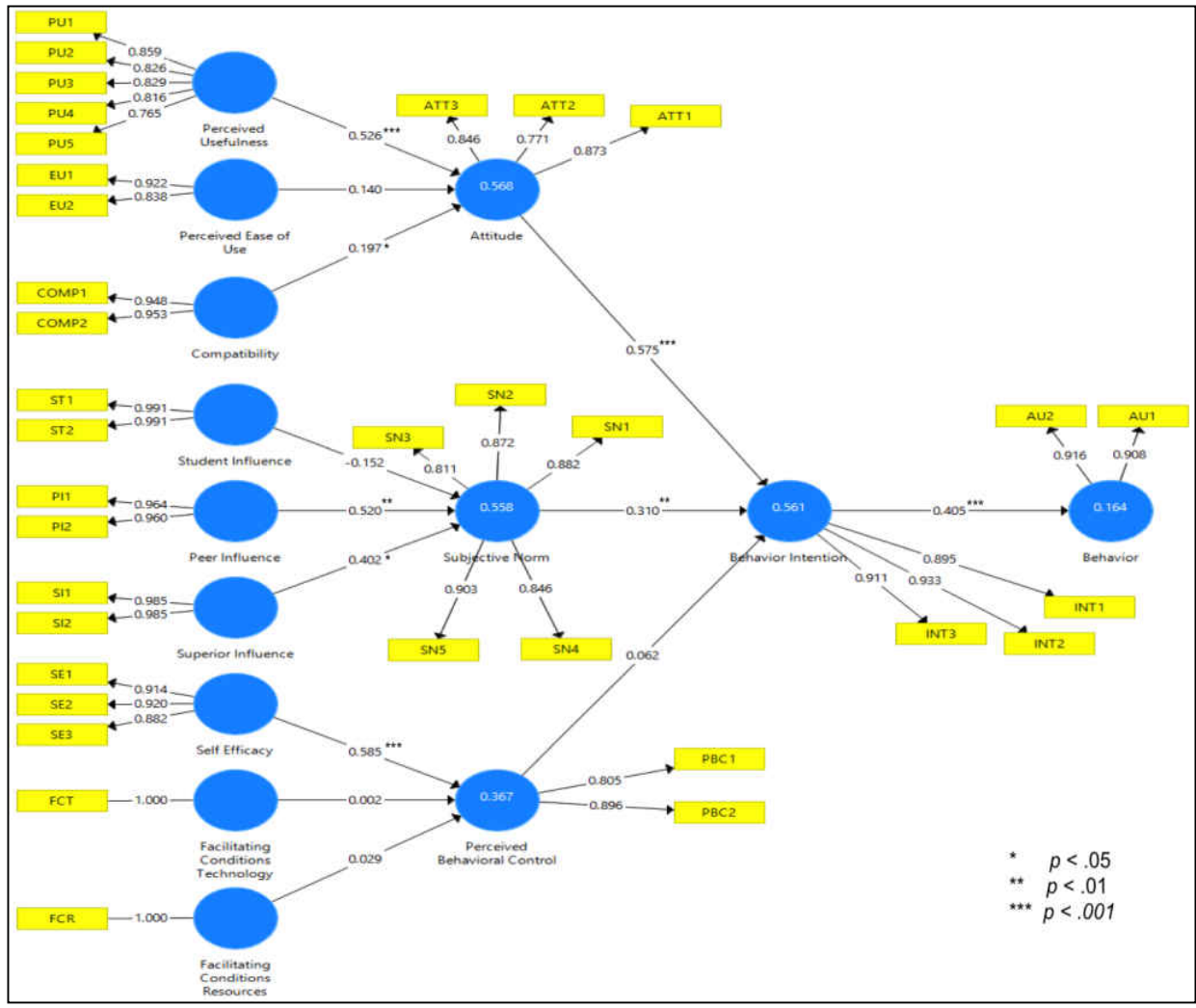


Figure 6. The PLS Path Model Results

Table 14. Hypotheses Test Results

Hypothesis	Constructs	Path Coefficient β	<i>t</i> -value	<i>p</i> -value	Results
H1	BI \rightarrow B	0.405	4.623	.000	Supported
H2	A \rightarrow BI	0.575	7.274	.000	Supported
H2a	PU \rightarrow A	0.526	5.422	.000	Supported
H2b	EU \rightarrow A	0.140	1.159	.247	Not Supported
H2c	COMP \rightarrow A	0.197	2.111	.035	Supported
H3	SN \rightarrow BI	0.310	2.934	.004	Supported
H3a	SI \rightarrow SN	0.402	2.345	.019	Supported
H3b	PI \rightarrow SN	0.520	5.099	.000	Supported
H3c	ST \rightarrow SN	-0.152	0.829	.408	Not Supported
H4	PBC \rightarrow BI	0.062	0.770	.442	Not Supported
H4a	SE \rightarrow PBC	0.585	5.753	.000	Supported
H4b	FCT \rightarrow PBC	0.002	0.016	0.840	Not Supported
H4c	FCR \rightarrow PBC	0.029	0.203	0.987	Not Supported

Attitude

The research hypotheses pertaining to the attitude construct are as follow:

- H2a: Perceived usefulness positively affects attitudes to use Web 2.0 tools;
- H2b: Perceived ease of use positively affects attitudes to use Web 2.0 tools;
- H2c: Perceived compatibility positively affects attitudes to use Web 2.0 tools.

The PLS-SEM results confirmed that the three factors combined, perceived usefulness, perceived ease of use, and compatibility explained 56.8% variance in attitude (R^2). Examining the path model results revealed that perceived usefulness ($\beta = 0.526$, $t = 5.422$) and compatibility ($\beta = 0.197$, $t = 2.111$) had significant effects on attitude toward using Web 2.0 tools. Therefore, the results of this study supported research hypotheses H2a and H2c. However, the results of path model indicated that perceived ease of use ($\beta = 0.140$, $t = 1.159$) did not have any significant effect on attitude. Thus, the research hypothesis H2b is not supported.

Subjective Norm

The following are the research hypotheses in regard to the subjective norm construct:

- H3a: Superior influence to use Web 2.0 tools positively affects the subjective norm of Saudi Arabian faculty;
- H3b: Peer influence to use Web 2.0 tools positively affects the subjective norm of Saudi Arabian faculty;
- H3c: Student influence to use Web 2.0 tools positively affects the subjective norm of Saudi Arabian faculty.

The PLS-SEM results confirmed that the three factors combined: student influence, peer influence, and superior influence explained about 55.8% of variance in subjective norm (R^2). Examining the path model results confirmed that peer influence ($\beta = 0.520$, $t = 5.099$) and superior influence ($\beta = 0.402$, $t = 2.345$) had significant effects on subjective norm. Thus, research hypotheses H3a and H3b are supported. Conversely, the path analysis results indicated that student influence ($\beta = -0.152$, $t = 0.829$) did not have

any significant effect on subjective norm. Accordingly, the research hypothesis H3c. is not supported.

Perceived Behavioral Control

The following are the research hypotheses in regard to the perceived behavioral control construct:

- H4a: Saudi Arabian faculty self-efficacy of using Web 2.0 tools positively affects perceived behavioral control;
- H4b: Facilitating technologies' conditions positively affects Saudi Arabian faculty perceived behavioral control;
- H4c: Facilitating resources' conditions positively affects Saudi Arabian faculty perceived behavioral control.

The PLS-SEM analysis results indicated that the three factors combined: self-efficacy, facilitating conditions technology, and facilitating conditions resources explained about 36.7% of variance in perceived behavioral control. Examining results from the path analysis, only self-efficacy component ($\beta = 0.585$, $t = 5.753$) had a significant effect on the perceived behavioral control. Therefore, the research hypothesis H4a is supported. As for research hypotheses H4b and H4c, the path model results indicated that facilitating conditions technology ($\beta = 0.002$, $t = 0.016$) and facilitating conditions resources ($\beta = 0.029$, $t = 0.203$) were found to be not significant, therefore, this study failed to confirm these hypotheses.

4.6 Summary

The statistical analyses that were used to analyze the data, describe the sample, and address the research questions and research hypotheses were presented in this

chapter. Since the constructs included in the model were satisfactory as all R^2 values were above 10%, this model can explain moderate variance in the constructs (Wook, Yusof, & Nazri, 2017). Eight hypotheses of the 13 hypotheses proposed in this study were supported. Among the three factors, attitude – subjective norms – and perceived behavioral control, attitude found to be having the strongest effect on the participants behavioral intention to use Web 2.0 tools into their classroom instruction. The next chapter will present discussion of the findings, implications for practice, and recommendations for future research.

CHAPTER 5: DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

This chapter discusses the findings of the analyses completed for the purpose of this study and provides recommendations based on the results. This chapter includes the following topics: discussion of findings, implications for practice and individuals in higher education institutions, limitations, and recommendations for future research.

5.1 Discussion of Findings

The purpose of this study was to examine Saudi faculty members' perceptions of using Web 2.0 tools in teaching and to explore the factors that influence their adoption of these tools in their classrooms. In this section, the findings of the analyses will be discussed.

5.1.1. Saudi Faculty Perceptions of Benefits and Use of Web 2.0 Tools

The results of the study indicate that a majority of the Saudi Arabian faculty members intend to use Web 2.0 tools in their future classrooms, not only to improve student learning, but also for other educational benefits. For instance, Saudi Arabian faculty members intend to use blogs and wikis to enhance student writing skills, social networking and instant messaging tools to improve students' satisfaction with the course, improve student-student interaction, and student-faculty interaction. This finding is comparable to other research findings, which suggested that faculty members in the United States considered Web 2.0 tools to have great potential for teaching and learning and potentially helped students to become active learners by allowing them to better create and retain knowledge (Ajjan & Hartshorne, 2008; Sadaf et al., 2013). Accordingly, these findings indicate that the use of Web 2.0 tools are suitable for supporting some of the well-known learning strategies such as collaborative learning, active learning, and

social learning. For instance, the participants in the present study indicated their intentions to use content collaboration tools, social networking sites, and instant messaging to improve their interaction with students and among the students themselves. In terms of the types of assignment Saudi Arabian faculty would consider using Web 2.0 tools to demonstrate knowledge, information application and information analysis were the most considered types among all the six categories according to Bloom's Taxonomy cognitive level. This finding suggest that the participants in the present study perceived Web 2.0 tools as beneficial tools to use in order to demonstrate knowledge based on the Bloom's Taxonomy.

Although the majority of Saudi Arabian faculty members in this study indicated that Web 2.0 tools provided many benefits, only few faculty members indicated using Web 2.0 tools for communication purposes between faculty-student and student-student. This finding can be explained by the participants' lack of experience and their comfort level in terms of using some of the Web 2.0 tools included in the study, which in turn could influence their avoidance for adopting these tools in their classrooms. This finding is comparable with other research that indicated lack of experience as one of the barriers that could prevent technology integration especially Web 2.0 tools in higher education (Reid, 2014). Additional factors that influence the limited adoption of Web 2.0 tools were explored in the following section.

5.1.2. Factors Predicting Saudi Faculty Members' Intentions to use Web 2.0

Tools

The path model results demonstrated that behavioral intention has a statistically significant positive relationship with usage behavior. This finding is similar to prior

research and is an expected result in using the DTPB (Ajjan & Hartshorne, 2008; Paver et al., 2014; Sadaf et al., 2013; Taylor & Todd, 1995). However, the effect size of the behavioral intention construct on usage behavior in the present study is relatively small (behavioral intention explained about 16.4% of the variance in usage behavior). This result may be attributed to the population.

The path model results indicated that the attitude construct had the strongest positive relationship with behavioral intention. This finding is consistent with prior research that have used the DTPB and suggested that attitude was the strongest predictor of behavioral intention (Ajjan & Hartshorne, 2008; Paver et al., 2014; Sadaf et al., 2013; Taylor & Todd, 1995). Further results found that subjective norm had a statistically significant positive relationship with behavioral intention. The path model results also showed that the participants' intentions are likely to be influenced by their peers and superiors in regard to using Web 2.0 tools in their classrooms. However, these participants were not influenced by the students. This finding diverges from (Ajjan & Hartshorne, 2008; Paver et al., 2014; Sadaf et al., 2013), which indicated that students were among the groups that influence faculty intentions to use Web 2.0 tools in their classrooms. One possible reason for this discrepancy between the results of this study and the other studies might be the difference in the educational systems and/or the learning environment between the different countries (i.e. United States and Kingdom of Saudi Arabia). As discussed in chapter two, the Saudi Arabian educational system is still transforming from being a teacher-centered traditional system to being more of a student-centered system (Hamdan, 2014; Khawaji, 2016). Faculty members might still be confused about the nature of their roles in student-centered learning environment. It also

could be challenging for them to renounce their authority and efficient position and move from being the solely source of knowledge to being a facilitator of knowledge and develop a different relationship with students. This may be attributed to the conservative nature of the Saudi Arabian educational system that is inherited from some historical interpretation of norms and beliefs in the society (Aifan, 2015; Hamdan, 2014; Khawaji, 2016).

This study contributes to the literature by confirming the findings from previous research, which indicated, that perceived usefulness and positive attitude are critical factors in predicting faculty intentions to use Web 2.0 tools in their classrooms. The study is unique in that it is the first comprehensive analysis of faculty intent to use Web 2.0 tools conducted solely among Saudi Arabian faculty. Moreover, this study revealed that Saudi faculty intended to use more Web 2.0 tools in their classrooms to improve student learning, student-student interaction, student-teacher interaction, collaborative learning, and student's writing ability. However, their level of comfort with some Web 2.0 tools may influence the avoidance of adopting these tools in their teaching practices. In addition, this study suggested that peer influence and superior influence had positive effect on the participants' intention to use Web 2.0 tools. Although prior research showed that student influence had positive relationship with faculty intention to use Web 2.0 tools (Ajjan & Hartshorne, 2008; Paver et al., 2014; Sadaf et al., 2013), in the current study, student influence was found to be non significant.

5.2. Implications for Practice

The results of this study have implications for administrators who are interested in increasing the use of Web 2.0 in higher education classrooms. The findings of this study

showed that positive attitudes and perceptions of perceived usefulness are significant predictors of Saudi Arabian faculty intentions to use Web 2.0 tools who participated in the current study. Focus on improving faculty's attitudes could be encouraged by specifically demonstrating the usefulness of integrating Web 2.0 tools into their classroom and how these tools can be compatible existing teaching style. This can be accomplished through faculty development programs and training that demonstrates the usefulness of integrating Web 2.0 tools for teaching and learning (Reid, 2014). Further, opportunities for faculty members to practice developing actual assignments within their courses that integrate Web 2.0 tools and reflect on their experiences may help improve faculty members attitudes and perceptions of perceived usefulness of Web 2.0 tools (Zelick, 2013). The results of this study indicated that superior influence and peer influence have significant effect on the participated faculty members' intentions to use Web 2.0 tools. Thus, the importance of peer influence and superior influence could be encouraged by providing ways in which faculty can speak and discuss with other faculty and head department about Web 2.0 integration. These peer-to-peer activities and discussions may occur during faculty development programs. Moreover, prior research showed that Saudi Arabian students have positive attitudes toward using some Web 2.0 tools to support their learning (Aifan, 2015). Thus, institutions could take steps toward requiring the integration of these tools by faculty in order to support student learning.

Another practical implication of this study relates to Saudi Arabian faculty intentions to use several Web 2.0 tools due to many educational benefits including improving students' learning, students' satisfaction with courses, students' writing ability, and student interactions with faculty and other students. Administrators could

support their faculty intentions to use Web 2.0 tools and facilitate the transition to the actual use of Web 2.0 tools by providing faculty with best practices models to facilitate the adoption of these tools in higher education (Paver et al., 2014). This can help them better understand the educational benefits of using Web 2.0 tools for student-centered learning. Additionally, knowing which Web 2.0 tools faculty are most comfortable using might allow for the integration of these tools across curriculum with least amount of training. The different Web 2.0 tools available to be used also might overwhelm faculty. Educational technology services could provide faculty with a list of recommended tools and applications along with some references to already existing training or best practices on how to integrate these tools in the classroom. The consistency in tools used by faculty could help reinforce the use and learning of these tools. Furthermore, educational technology services could implement different training sessions across the university including formal face-to-face instructional sessions in varying locations and times as well as online tutorials. Providing different types of training could allow access to a larger percentage of the population and accommodate the different learning styles among faculty. Since prior research had shown that Saudi Arabian students had positive attitude toward using some Web 2.0 tools to support their learning (Aifan, 2015), administrators may want to discuss and encourage Web 2.0 tools integration with faculty and facilitate opportunities outside the classroom where students can speak about their experience with using these tools in learning. This feedback can help faculty, administrators, and educational technology services to shape future curriculum.

5.3. Limitations

This study was conducted using Saudi Arabian faculty members who were teaching at a public university in Jeddah, Saudi Arabia. Generalization to other Saudi Arabian faculty at other Saudi Arabian colleges or universities may not be relevant. Moreover, this study was limited by the ability of the DTPB to be an accurate predictor of the use of Web 2.0 tools in teaching and learning. Namely, the constructs that were measured in this study may be difficult to define or the results may be somehow be impacted by the respondents' descriptions or perceptions of these constructs that were studied (Ali et al., 2017; Hair et al., 2017). An additional limitation is that this study relied on self-reported data, which means that the participants may not responded honestly or responded to their personal understanding of the constructs included in the study. The last limitation of the study is that the participants were not selected randomly; they were selected according to their willingness to participate and complete the survey. These respondents may have been more familiar with technology than those that did not answer the survey.

5.4. Recommendations for Future Research

The aim of this study was to gain understanding regarding Saudi Arabian faculty perceptions of the educational benefits of using Web 2.0 tools in their classrooms and to examine the factors influencing faculty decision to use such tools using the decomposed theory of planned behavior. The results of this study were encouraging, however, the results lead to new questions and concerns. The results of this study provided a foundation for future research that may examine the factors more in depth. For example, future research may focus on determining specific interventions that would possibly help

to increase Saudi Arabian faculty attitudes and perceived usefulness of Web 2.0 tools. Researchers may want to explore the factors that influence Saudi Arabian faculty decision to adopt Web 2.0 tools in depth based on gender differences giving the fact that almost every university in the Kingdom of Saudi Arabia has segregated campuses (i.e. female campus and male campus). Thus, it might be interested to examine how gender contributes to the variance in attitude, subjective norm, and perceived behavior control on actual behavior related to the use of Web 2.0 tools. Further, the results could be evaluated based on longevity of teaching, or the technological self-efficacy of the respondents.

Additionally, researchers may want to focus on examining a specific type of Web 2.0 tools such as wikis, blogs, social networking, media sharing, IM, or content collaboration tools. The integration of each of these tools in the classroom could vary, warranting different impact on the learning environment and students' achievement. Future research could focus on examining differences in the impact of Web 2.0 tools integration by controlling the type of Web 2.0 tools used in the application.

APPENDIX A: THE SURVEY

Investigating Factors Influencing Saudi Faculty Decisions to Adopt Web 2.0 Tools

Section 1: Background Information	الجزء الأول: معلومات أساسية
<p>1. Gender</p> <ul style="list-style-type: none"> <input type="radio"/> Male <input type="radio"/> Female 	<p>1. الجنس</p> <ul style="list-style-type: none"> <input type="radio"/> ذكر <input type="radio"/> أنثى
<p>2. Age</p> <ul style="list-style-type: none"> <input type="radio"/> Under 30 <input type="radio"/> 31 - 39 <input type="radio"/> 40 - 49 <input type="radio"/> 50 - 59 <input type="radio"/> Over 60 	<p>2. العمر</p> <ul style="list-style-type: none"> <input type="radio"/> أقل من ٣٠ <input type="radio"/> ٣١ - ٣٩ <input type="radio"/> ٤٠ - ٤٩ <input type="radio"/> ٥٠ - ٥٩ <input type="radio"/> ٦٠ فما فوق
<p>3. University:</p>	<p>3. اسم الجامعة:</p>
<p>4. Type of University</p> <ul style="list-style-type: none"> <input type="radio"/> Public <input type="radio"/> Private 	<p>4. نوع الجامعة</p> <ul style="list-style-type: none"> <input type="radio"/> حكومية <input type="radio"/> خاصة
<p>5. Role at University:</p> <ul style="list-style-type: none"> <input type="radio"/> Lecturer/Visiting Professor <input type="radio"/> Assistant Professor <input type="radio"/> Associate Professor <input type="radio"/> Professor <input type="radio"/> Graduate Student/Teaching Assistant <input type="radio"/> Other 	<p>5. المسمى الوظيفي:</p> <ul style="list-style-type: none"> <input type="radio"/> محاضر(ة) / دكتور زائر <input type="radio"/> أستاذ مساعد <input type="radio"/> أستاذ مشارك <input type="radio"/> بروفيسور <input type="radio"/> طالب(ة) دراسات عليا/معيد(ة) <input type="radio"/> آخر
<p>6. College/Department:</p>	<p>6. الكلية / القسم:</p>
<p>7. Number of Years Teaching in Higher Education:</p> <ul style="list-style-type: none"> <input type="radio"/> 1- 5 years <input type="radio"/> 6 - 10 years <input type="radio"/> 11 - 15 years <input type="radio"/> 16 - 20 years <input type="radio"/> 21 years or more 	<p>7. عدد سنين التدريس في مؤسسات التعليم الجامعي:</p> <ul style="list-style-type: none"> <input type="radio"/> ١ - ٥ سنين <input type="radio"/> ٦ - ١٠ سنين <input type="radio"/> ١١ - ١٥ سنة <input type="radio"/> ١٦ - ٢٠ سنة <input type="radio"/> ٢١ سنة أو أكثر

Section 2: Web 2.0 Technologies	الجزء الثاني: تقنيات الويب 2.0
<p>8. Please list your comfort level with the following Web 2.0 applications (Never Use, Novice, Competent, Proficient):</p> <ul style="list-style-type: none"> ○ Blogs (Tumblr, Blogger, WordPress) ○ Wikis (Wikipedia, Wikispaces) ○ Social Networking (Facebook, Twitter, Linked IN) ○ Instant Messaging (WhatsApp, iMessage) ○ Audio/Video Conferencing (Google Hangouts, Skype, and Facetime) ○ Media Sharing (YouTube, Instagram, Flickr) ○ Social Sharing and Curation (Pinterest) ○ Content Collaboration Tools (Prezi, Google Drive, Microsoft OneDrive) 	<p>8. الرجاء تحديد درجة الاستعمال لتطبيقات الويب 2.0 التالية (لم أستخدمها من قبل، مبتدئ، متمكن، خبير):</p> <ul style="list-style-type: none"> ○ المدونات (Tumblr, Blogger, WordPress) ○ ويكي (المواقع التي تتيح للمستخدمين المشاركة في اضافة وتعديل المحتوى مثال: Wikipedia, Wikispaces) ○ مواقع التواصل الاجتماعي (Facebook, Twitter, Linked IN) ○ المراسلة الفورية (WhatsApp, iMessage) ○ الاتصال الصوتي والمرئي (Google Hangouts, Skype, and Facetime) ○ مشاركة الوسائط (YouTube, Instagram, Flickr) ○ تطبيقات المشاركة والمعالجة الاجتماعية للصور (Pinterest) ○ تطبيقات تحرير المحتوى بمشاركة الآخرين (Prezi, Google Drive, Microsoft OneDrive)
<p>9. To what extent do you use the following Web 2.0 applications to supplement your in-class lecture (Don't use and don't plan to use, Don't use but plan to use, Use occasionally, Frequently Use, Always Use, NA)</p> <ul style="list-style-type: none"> ○ Blogs (Tumblr, Blogger, WordPress) ○ Wikis (Wikipedia, Wikispaces) ○ Social Networking (Facebook, Twitter, Linked IN) ○ Instant Messaging (WhatsApp, iMessage) ○ Audio/Video Conferencing (Google Hangouts, Skype, and Facetime) ○ Media Sharing (YouTube, Instagram, Flickr) ○ Social Sharing and Curation 	<p>9. إلى أي مدى تستخدم تطبيقات الويب 2.0 التالية في التدريس كأدوات مكملة للمحاضرات (لا أستخدمها ولا أخطط لاستخدامها، لا أستخدمها ولكن أخطط لاستخدامها، أستخدمها أحياناً، أستخدمها كثيراً، أستخدمها دائماً، غير قابل للتطبيق)</p> <ul style="list-style-type: none"> ○ المدونات (Tumblr, Blogger, WordPress) ○ ويكي (المواقع التي تتيح للمستخدمين المشاركة في اضافة وتعديل المحتوى مثال: Wikipedia, Wikispaces) ○ مواقع التواصل الاجتماعي (Facebook, Twitter, Linked IN) ○ المراسلة الفورية (WhatsApp, iMessage) ○ الاتصال الصوتي والمرئي (Google Hangouts, Skype, and Facetime) ○ مشاركة الوسائط (YouTube, Instagram, Flickr) ○ تطبيقات المشاركة والمعالجة الاجتماعية

<p>(Pinterest)</p> <ul style="list-style-type: none"> ○ Content Collaboration Tools (Prezi, Google Drive, Microsoft OneDrive) 	<p>للصور (Pinterest)</p> <ul style="list-style-type: none"> ○ تطبيقات تحرير المحتوى بمشاركة الآخرين (Prezi, Google Drive, Microsoft OneDrive)
<p>10. What are, in your opinion, the advantages of using each of the following Web 2.0 technologies? (Blogs, Wikis, Social Networking Social Bookmarking, Instant Messaging, Internet Telephony, Audio/Video Conferencing)</p> <ul style="list-style-type: none"> ○ Improve students' interaction with faculty ○ Improve students' learning ○ Improve students' satisfaction with the course ○ Improve students' interaction with other students ○ It could be easily integrated into my course ○ It could be effectively integrated into my course ○ Improve students' grades ○ Improve students' writing ability 	<p>10. في اعتقادك، ما هي فوائد استخدام كل من تطبيقات الويب 2.0 التالية (المدونات، ويكي، مواقع التواصل الاجتماعي، مواقع التفضيل الاجتماعي، رسائل الجوال الفورية، المكالمات الهاتفية عبر الإنترنت، والاتصال الصوتي والمرئي)</p> <ul style="list-style-type: none"> ○ تحسين مستوى تفاعل الطلاب مع أعضاء هيئة التدريس ○ تحسين مستوى تعلم الطلاب ○ تحسين مستوى رضا الطلاب عن المادة ○ تحسين مستوى تفاعل الطلاب بين بعضهم البعض ○ يمكنني بسهولة استخدامها وجعلها جزء من المقرر التعليمي ○ يمكنني استخدامها في المقرر التعليمي على نحو فعال ○ تحسين درجات الطلاب ○ تحسين قدرة الطلاب على الكتابة
<p>10. When assigning Web 2.0 technologies to demonstrate knowledge, the types of assignments include those that (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree, Don't Know):</p> <ul style="list-style-type: none"> ○ Listing, Recalling, Outlining, or and Ordering Information ○ Separating, Classifying, Googling, Bookmarking, Comparing, and Finding Information ○ Applying, Illustrating, Producing, Editing, and Solving Information ○ Explaining, Paraphrasing, and Discussing Information 	<p>10. أنواع المهام التي أعددتها للطلبة ويتم استخدام تطبيقات الويب 2.0 فيها لإثبات المعرفة تتضمن التالي (أتفق جداً، أتفق، محايد، لا أتفق، لا أتفق أبداً، لا أعرف):</p> <ul style="list-style-type: none"> ○ تعداد، تذكر، استعراض النقاط الرئيسية، أو/ و ترتيب المعلومات ○ توضيح الفروقات، تصنيف، بحث عن معلومات أو مواقع الكترونية بواسطة جوجل، وإجراء المقارنات. ○ تطبيق، شرح، إنتاج، تصحيح، وحل المبادئ والأفكار. ○ تفسير، إعادة صياغة، ومناقشة المعلومات. ○ تصميم، إنتاج، إنشاء، اختراع، نشر، وصياغة المعلومات. ○ استقصاء، إنشاء فرضيات، تعليق، نشر، ومقارنة المعلومات.

<ul style="list-style-type: none"> ○ Designing, Producing, Creating, Inventing, Publishing, or Composing Information ○ Investigating, Hypothesizing, Commenting, Posting, and Contrasting Information 	
<p>Section 3: Web 2.0 Technologies Adoption</p>	<p>الجزء الثالث: اعتماد تطبيقات الويب 2.0</p>
<p>11. Which of these Web 2.0 technologies do you most frequently use (or might use in the near future) to supplement your in-class learning:</p> <ul style="list-style-type: none"> ○ Blogs (Tumblr, Blogger, WordPress) ○ Wikis (Wikipedia, Wikispaces) ○ Social Networking (Facebook, Twitter, Linked IN) ○ Instant Messaging (WhatsApp, iMessage) ○ Audio/Video Conferencing (Google Hangouts, Skype, and Facetime) ○ Media Sharing (YouTube, Instagram, Flickr) ○ Social Sharing and Curation (Pinterest) ○ Content Collaboration Tools (Prezi, Google Drive, Microsoft OneDrive) ○ Other, _____ 	<p>11. أي من تطبيقات الويب 2.0 التالية تستخدمها بشكل متكرر (أو تنوي استخدامها في المستقبل القريب) كأدوات مكملة للمقرر التعليمي:</p> <ul style="list-style-type: none"> ○ المدونات (Tumblr, Blogger, WordPress) ○ ويكي (المواقع التي تتيح للمستخدمين المشاركة في اضافة وتعديل المحتوى مثال: Wikipedia, Wikispaces) ○ مواقع التواصل الاجتماعي (Facebook, Twitter, Linked IN) ○ المراسلة الفورية (WhatsApp, iMessage) ○ الاتصال الصوتي والمرئي (Google Hangouts, Skype, and Facetime) ○ مشاركة الوسائط (YouTube, Instagram, Flickr) ○ تطبيقات المشاركة والمعالجة الاجتماعية للصور (Pinterest) ○ تطبيقات تحرير المحتوى بمشاركة الآخرين (Prezi, Google Drive, Microsoft OneDrive) ○ أخرى: _____
<p>12. Thinking of that Web 2.0 technology you use most frequently in your classroom (based on the previous question) to what extent do you agree or disagree with the following statements (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree, Don't Know)</p> <ul style="list-style-type: none"> ○ I believe that I could communicate to others the consequences of using Web 	<p>12. بناءً على مستوى الاستخدام لتطبيقات الويب 2.0 من السؤال السابق، إلى أي مدى تتفق أو تختلف مع العبارات التالية (أتفق جداً، أتفق، محايد، لا أتفق، لا أتفق أبداً، لا أعرف)</p> <ul style="list-style-type: none"> ○ أعتقد أنني أستطيع التحدث عن نتائج استخدام تطبيقات الويب 2.0 في القاعة الدراسية ○ لا أواجه أي صعوبات في التحدث عن فوائد تطبيقات الويب 2.0 من عدمها ○ أخطط لاستخدام تطبيقات الويب 2.0 في تدريس المواد

<p>2.0 in the classroom</p> <ul style="list-style-type: none"> ○ I would have no difficulty explaining why Web 2.0 technologies may or may not be beneficial ○ I plan to use Web 2.0 technologies in my classroom ○ I intend to use Web 2.0 technologies within the next semester ○ I will add Web 2.0 technologies to my class next semester ○ Web 2.0 is useful in my teaching ○ The advantage of using Web2.0 outweighs the disadvantages of not using it ○ Using Web 2.0 is a good idea ○ I feel that using Web2.0 will be easy ○ I feel that using Web 2.0 will be easy to incorporate in my classroom environment ○ I feel that using Web 2.0 will help my students learn more about the subject ○ I feel that using Web 2.0 will improve students' satisfaction with the course ○ I feel that using Web 2.0 will improve students' grades ○ I feel that using Web 2.0 will improve students' evaluation ○ To help my students better learn the material, I will incorporate Web 2.0 technologies in the classroom ○ My peers think I will benefit from using Web 2.0 technologies in my classroom ○ My peers are using Web 2.0 technologies in their classroom ○ My superior confirms my ability and knowledge to use Web 2.0 technologies in the classroom ○ My superior thinks it is important I use Web 2.0 technologies in my classroom ○ My students will think it is important to use Web 2.0 technologies in my classroom ○ Using the Web 2.0 technologies is entirely within my control 	<ul style="list-style-type: none"> ○ أخطط لاستخدام تطبيقات الويب 2.0 في الفصل الدراسي المقبل ○ سأضيف تطبيقات الويب 2.0 في تدريسي للفصل الدراسي القادم ○ تطبيقات الويب 2.0 مفيدة ومساعدة لأداء مهامي التعليمية ○ ايجابيات استخدام تطبيقات الويب 2.0 تفوق سلبيات عدم استخدامها ○ يعتبر استخدام تطبيقات الويب 2.0 فكرة جيدة ○ أشعر بأن استخدام تطبيقات الويب 2.0 سيكون سهلاً ○ أشعر أن إدخال تطبيقات الويب 2.0 في المادة والبيئة التعليمية سيكون سهلاً ○ أشعر بأن استخدام تطبيقات الويب 2.0 سيساعد طلابي على التعلم والتمكن من المادة العلمية ○ أشعر بأن استخدام تطبيقات الويب 2.0 سيحسن من مستوى رضا الطلبة عن المادة العلمية ○ أشعر بأن استخدام تطبيقات الويب 2.0 سيحسن علامات الطلبة ○ أشعر بأن استخدام تطبيقات الويب 2.0 سيحسن من تقييم الطلبة ○ لمساعدة طلابي على فهم المادة، سوف أقوم بإدخال واستخدام تطبيقات الويب 2.0 في التدريس ○ يعتقد زملائي من أعضاء هيئة التدريس أنني سوف أستفيد من استخدام تطبيقات الويب 2.0 في التدريس ○ يستخدم زملائي من أعضاء هيئة التدريس تطبيقات الويب 2.0 في أداء مهامهم التعليمية ○ يرى رئيسي بأنني قادر على استخدام تطبيقات الويب 2.0 في أداء مهامي التعليمية ○ يعتقد رئيسي أنه من الضروري أن أستخدم تطبيقات الويب 2.0 في التدريس ○ يعتقد طلابي أنه من الضروري أن أستخدم تطبيقات الويب 2.0 في التدريس ○ أستطيع التحكم بالكامل في استخدام تطبيقات الويب 2.0 ○ أنا أملك المعرفة والقدرة على استخدام تطبيقات الويب 2.0 ○ يعتقد زملائي المؤثرين من أعضاء هيئة التدريس بأنني يجب أن أستخدم تطبيقات الويب 2.0 في التدريس ○ يعتقد زملائي القريبين مني من أعضاء هيئة التدريس أنه يتوجب علي استخدام تطبيقات الويب 2.0 في التدريس
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<ul style="list-style-type: none"> ○ I have the knowledge and ability to use Web 2.0 ○ Peers who influence my behavior would think that I should use Web 2.0 technologies in the classroom ○ Peers who are important to me would think that I should use Web 2.0 technologies in the classroom ○ My superior, who influences my behavior, would think that I should use Web 2.0 technologies in the classroom ○ My superior whom I report to would think that I should use Web 2.0 technologies in the classroom ○ Students who influence my behavior would think that I should use Web 2.0 technologies in the classroom ○ Students who are important to me think that I should use Web 2.0 technologies in the classroom ○ Using Web 2.0 technologies is compatible with the way I teach ○ Using Web 2.0 technologies fits well with the way I teach ○ I can use Web 2.0 technologies using any computer connected to the Internet ○ The Web 2.0 technologies are compatible with the computer I already use in the classroom ○ I know enough to use Web 2.0 technologies ○ I could easily use Web 2.0 technologies on my own ○ I would feel comfortable using Web 2.0 technologies 	<ul style="list-style-type: none"> ○ يعتقد رئيسي المؤثر أنه يتوجب علي استخدام تطبيقات الويب 2.0 في التدريس ○ يعتقد رئيسي المباشر أنه يتوجب علي استخدام تطبيقات الويب 2.0 ○ يعتقد الطلاب المؤثرون على قراراتي في التدريس بوجوب استخدام تطبيقات الويب 2.0 ○ يعتقد الطلاب المهمون لدي بوجوب استخدام تطبيقات الويب 2.0 في التدريس ○ استخدام تطبيقات الويب 2.0 يتوافق مع الطريقة التي أدرّس بها ○ استخدام تطبيقات الويب 2.0 يتناسب بشكل جيد مع الطريقة التي أدرّس بها ○ أستطيع استخدام تطبيقات الويب 2.0 مع أي جهاز متصل بالانترنت ○ تطبيقات الويب 2.0 متوافقة مع الجهاز الموجود في القاعة الدراسية ○ أنا أملك من المعلومات ما يكفي لاستخدام تطبيقات الويب 2.0 ○ أنا أستطيع استخدام تطبيقات الويب 2.0 بسهولة معتمداً على قدرتي ○ أنا قادر على استخدام تطبيقات الويب 2.0 بأريحية
<p>13. What percentage of instructional personnel (instructors and instructional designers) do you know at your school have adopted Web 2.0 tools for instruction?</p> <ul style="list-style-type: none"> ○ Percentage slider indicator 	<p>13. ما هي نسبة الكادر التعليمي (مدرسين و/ أو مصممي المناهج) الذين تعرفهم في الكلية أو الجامعة التي تعمل بها ويقومون باستخدام تطبيقات الويب 2.0 في المقررات التعليمية؟</p> <ul style="list-style-type: none"> ○ محدد نسبة مئوية

APPENDIX B: IRB APPROVAL LETTER



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Determination of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **May H Alashwal**

Date: **February 01, 2018**

Dear Researcher:

On 02/01/2018, the IRB reviewed the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination under U.S. Federal Regulations
Category 2 – Adult Participants – N=300
Project Title: Faculty Use and Perceptions of Web 2.0 tools in Saudi Arabia Higher Education Institutions
Investigator: May H Alashwal
IRB Number: SBE-17-13681
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

All data must be retained and secured for a minimum of five years past the completion of this research.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#). For the in person interviews/surveys in Saudi Arabia, you must seek local ethics approval. The UCF IRB does not have jurisdiction out of the US.

This letter is signed by:

Signature applied by Jennifer Neal-Jimenez on 02/01/2018 02:35:28 PM EST

Designated Reviewer

APPENDIX C: EMAIL INVETATION FOR SURVEY PARTICIPATION

إلى أعضاء هيئة التدريس بجامعة

تحية طيبة وبعد،

أتمنى مساعدتكم لجمع بيانات بحث الدكتوراه المتعلقة بمعرفة آراء واستخدامات أعضاء هيئة التدريس السعوديين والسعوديات لأدوات وتطبيقات الويب 2.0 (مثل المدونات، الويكي، وسائل التواصل الاجتماعي وغيرها) .. مشاركتكم في الإجابة على هذا الاستبيان ستساعدني في جمع البيانات المطلوبة ، كما أن المشاركة في الاستبيان تطوعية ولن يتم مشاركة المعلومات مع الغير. يمكن المشاركة في الاستبيان بالاجابة عبر الكمبيوتر او الهاتف الجوال عبر الرابط أدناه .. أرجو إعادة إرساله وتمريه لزميلات وزملاء العمل من أعضاء هيئة التدريس السعوديين والسعوديات حتى أتمكن من الوصول إلى العدد المطلوب لإتمام الدراسة .. إذا سبق وأكملت هذا الاستبيان، فشكراً لك ، وأرجو تجاهل هذه الرسالة .. شاكرة ومقدرة حسن تعاونكم ..

Follow this link to the Survey:

{//SurveyLink?d=Take the Survey}

مي الأشول

بريد الكتروني: msalashwal@knights.ucf.edu

طالبة الدكتوراه بجامعة وسط فلوريدا ، الولايات المتحدة الأمريكية

Translation of the Email Invitation to Participate in the Study

Dear Faculty Members at XXX University,

Greetings,

I'd like to ask for your participation in a study I'm conducting to explore the Saudi faculty perceptions and use of Web 2.0 tools (e.g. blogs, wikis, social networking sites and others) in higher education. Your participation in this survey is voluntary and will help me to collect data needed for this study. The information will be kept confidential. You can complete this survey by using your desktop or mobile phones through the link provided below. Please forward this email to your colleagues so I can reach the targeted number for this study. If you already completed the survey, thank you and please ignore this message. Much appreciated..

Follow this link to the Survey:

{//SurveyLink?d=Take the Survey}

May Alashwal

Email: msalashwal@knights.ucf.edu

PhD Candidate at University of Central Florida, USA

REFERENCES

- 7 things you should know about privacy in Web 2.0 learning environments. (2010, September). *EDUCAUSE Learning Initiative*. Retrieved from <https://library.educause.edu/resources/2010/9/7-things-you-should-know-about-privacy-in-web-20-learning-environments>
- Ahmad, P., Hussain, A., & Aqil, M. (2013). Use of web 2.0 in Saudi Arabia universities. *International Journal of Information Dissemination & Technology*, 3(3), 158–166.
- Aifan, H. (2015). *Saudi students' attitudes toward using social media to support learning* (Doctoral dissertation, University of Kansas). Retrieved from https://kuscholarworks.ku.edu/bitstream/handle/1808/19498/Aifan_ku_0099D_13943_D ATA_1.pdf;sequence=1
- Ajjan, H., & Hartshorne, R. (2008). Investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical tests. *The Internet and Higher Education*, 11(2), 71–80.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior & Human Decision Processes*, 50(2), 179–211.
- Al-Asmari, A. M., & Khan, M. S. R. (2014). E-learning in Saudi Arabia: Past, present and future. *Near & Middle Eastern Journal of Research in Education*, 2014(1), 1–11.
- Al-Dheleai, Y. M., & Tasir, Z. (2017). Using Facebook for the purpose of students' interaction and its correlation with students' academic performance. *Turkish Online Journal of Educational Technology - TOJET*, 16(4), 170–178.
- Alebaikan, R., & Troudi, S. (2010). Blended learning in Saudi universities: Challenges and perspectives. *ALT-J*, 18(1), 49–59.

- Alexander, B. (2006). Web 2.0: A new wave of innovation for teaching and learning?
EDUCause Review, 41(2), 32–44.
- Alfahad, F. N. (2012). Effectiveness of using information technology in higher education in Saudi Arabia. *Procedia - Social and Behavioral Sciences*, 46, 1268–1278.
- Alharbi, M. (2015). Effects of Blackboard’s discussion boards, blogs and wikis on effective integration and development of literacy skills in EFL students. *English Language Teaching*, 8(6), 111–132.
- Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2017). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management*, 30(1), 514–538.
- Al-Hojailan, M. I. A. (2013). *The effectiveness of the social network in higher education in Saudi Arabia: Action research to develop an e-learning conceptual model based on blog tools* (Doctoral thesis, De Montfort University, Leicester, England). Retrieved from <http://hdl.handle.net/2086/9505>
- AlJeraisy, M. N., Mohammad, H., Fayyumi, A., & Alrashideh, W. (2015). Web 2.0 in education: The impact of discussion board on student performance and satisfaction. *Turkish Online Journal of Educational Technology - TOJET*, 14(2), 247–258.
- Alkhalaf, S., Nguyen, J., Nguyen, A., & Drew, S. (2013). Online learner satisfaction and collaborative learning: Evidence from Saudi Arabia. *International Journal of Information and Communication Technology Education*, (2), 66–78.

- Al-Khalifa, H. (2010). Elearning in Saudi Arabia. In U. Demiray (Ed.), *Cases on challenges facing e-learning and national development: Institutional studies and practices. E-Learning practices* (pp. 745–772). Eskisehir-Turkey: Anadolu University.
- Allen, M. (2013). What was Web 2.0? Versions as the dominant mode of Internet history. *New Media & Society*, 15(2), 260–275.
- Alsaady, A. (2007). *Planning strategy and the use of information technology in higher education: A comparative analysis of two universities in Michigan* (Doctoral dissertation, Capella). Retrieved from <https://search.proquest.com/docview/304722700/abstract/91442A7D781E4AEAPQ/1>
- Alturki, U. (2014). The development of online distance education in Saudi Arabia. *eLearn Magazine*. Retrieved from <http://elearnmag.acm.org/archive.cfm?aid=2673861>
- Alzahrani, I. (2012). *Evaluate Wiki technology as e-Learning tool from the point view of Al-Baha University students: A pilot study with undergraduate students in both faculties of science and education*. Presented at the Annual Meeting of the Education, Learning, Styles, Individual Differences Network (ELSIN), Cardiff, United Kingdom. Retrieved from <https://eric.ed.gov/?id=ED533226>
- An, Y. J., & Williams, K. (2010). Teaching with Web 2.0 technologies: Benefits, barriers and lessons learned. *International Journal of Instructional Technology and Distance Learning*, 7(3), 41–48.
- Anderson, P. (2007). *What is Web 2.0? Ideas, technologies and implications for education*. JISC Technology and Standards Watch. Retrieved from http://www.ictliteracy.info/rf.pdf/Web2.0_research.pdf

- Anderson, T. (2012). Networks, web 2.0, and the connected learner. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (3rd Edition, pp. 299–308). Pearson, MA: Boston.
- Andujar, A. (2016). Benefits of mobile instant messaging to develop ESL writing. *System*, *62*, 63–76.
- Avci, H., & Adiguzel, T. (2017). A case study on mobile-blended collaborative learning in an English as a foreign language (EFL) context. *International Review of Research in Open and Distributed Learning*, *18*(7), 45–58.
- Aydin, Z., & Yildiz, S. (2014). Using wikis to promote collaborative EFL writing. *Language Learning & Technology*, *18*(1), 160–180.
- Baro, E. E., Idiodi, E. O., & Godfrey, V. Z. (2013). Awareness and use of Web 2.0 tools by librarians in university libraries in Nigeria. *OCLC Systems & Services: International Digital Library Perspectives*, (3), 170–188.
- Bartolomé, A. (2008). Web 2.0 and new learning paradigms. *ELearning Papers*, *8*, 1–10.
- Baylor, A. L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & Education*, *39*(4), 395–414.
- Bennett, S., Bishop, A., Dalgarno, B., Waycott, J., & Kennedy, G. (2012). Implementing Web 2.0 technologies in higher education: A collective case study. *Computers & Education*, *59*(2), 524–534.
- Boyd, D. M., & Ellison, N. B. (2007). Social Network Sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230.

- Brodahl, C., & Hansen, N. K. (2014). Education students' use of collaborative writing tools in collectively reflective essay papers. *Journal of Information Technology Education, 13*, 91–120.
- Brown, J. S., & Adler, R. P. (2008, January/February). Minds on fire: Open education, the long tail, and learning 2.0. *EDUCAUSE Review*. Retrieved from <https://clalliance.org/wp-content/uploads/files/ERM0811.pdf>
- Buchanan, T., Sainter, P., & Saunders, G. (2013). Factors affecting faculty use of learning technologies: implications for models of technology adoption. *Journal of Computing in Higher Education, 25*(1), 1–11.
- Budge, K. (2015). Social media as conduit in art: Understanding connections to communities of practice through professional learning theory. *Visual Inquiry: Learning & Teaching Art, 4*(3), 169–179.
- Burhanna, K. J., Seeholzer, J., & Salem, J. (2009). No natives here: A focus group study of student perceptions of Web 2.0 and the academic library. *The Journal of Academic Librarianship, 35*(6), 523–532.
- Buzzetto-More, N. A. (2014). An examination of undergraduate student's perceptions and predilections of the use of YouTube in the teaching and learning process. *Interdisciplinary Journal of E-Learning & Learning Objects, 10*, 17–32.
- Carroll, J. A., Diaz, A., Meiklejohn, J., Newcomb, M., & Adkins, B. (2013). Collaboration and competition on a wiki: The praxis of online social learning to improve academic writing and research in under-graduate students. *Australasian Journal of Educational Technology, 29*(4), 513–525.

- Cassidy, E. D., Colmenares, A., Jones, G., Manolovitz, T., Shen, L., & Vieira, S. (2014). Higher education and emerging technologies: Shifting trends in student usage. *The Journal of Academic Librarianship*, 40(2), 124–133.
- Chan, E. (2013). Flexible delivery approach in architecture and construction management course. *European Journal of Educational Research*, 2(3), 139–149.
- Cherney, I. D. (2008). The effects of active learning on students' memories for course content. *Active Learning in Higher Education*, 9(2), 152–171.
- Chickering, A. W., & Gamson, Z. F. (1991). *Applying the seven principles for good practice in undergraduate education*. San Francisco, Calif: Jossey-Bass Inc., 1991.
- Chiou, Y. F. (2011). *Perceived usefulness, perceive ease of use, computer attitude, and using experience of Web 2.0 applications as predictors of intent to use Web 2.0 by pre-service teachers for teaching* (Doctoral dissertation, Ohio University). Retrieved from https://etd.ohiolink.edu/pg_10?0::NO:10:P10_ACCESSION_NUM:ohiou1303314743#abstract-files
- Chu, S. K. W., Siu, F., Liang, M., Capio, C. M., & Wu, W. W. Y. (2013). Users' experiences and perceptions on using two wiki platforms for collaborative learning and knowledge management. *Online Information Review*, 37(2), 304–325.
- Chugh, R., & Ruhi, U. (2018). Social media in higher education: A literature review of Facebook. *Education and Information Technologies*, 23(2), 605–616.
- Claman, F. (2015). The impact of multiuser virtual environments on student engagement. *Nurse Education in Practice*, 15(1), 13–16.

- Clark, W., Logan, K., Luckin, R., Mee, A., & Oliver, M. (2009). Beyond Web 2.0: Mapping the technology landscapes of young learners. *Journal of Computer Assisted Learning*, 25(1), 56–69.
- Cochrane, T. (2006). Learning with wireless mobile devices and social. *Proceedings of the 23rd annual ascilite conference* (pp. 143–146). Sydney, Australia.
- Collins, A., & Halverson, R. (2010). The second educational revolution: Rethinking education in the age of technology. *Journal of Computer Assisted Learning*, 26(1), 18–27.
- Cooper, P. A. (1993). Paradigm shifts in designed instruction: From behaviorism to cognitivism to constructivism. *Educational Technology*, 33(5), 12–19.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, California: SAGE Publications, c2014.
- Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. *Social Media in Higher Education*, 15(1), 3–8.
- Dafoulas, G. A., & Shokri, A. (2014). *Delivery of e-learning through social learning networks*. Paper presented at the International Conference e-Learning 2014. Multi Conference on Computer Science and Information Systems, Lisbon, Portugal.
- Davidson, N., & Major, C. H. (2014). Boundary crossings: Cooperative learning, collaborative learning, and problem-based learning. *Journal on Excellence in College Teaching*, 25(3), 7–55.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.

- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. Hoboken: Wiley, 2014.
- Doggett, A. M. (2007). The videoconferencing classroom: What do students think? *Journal of Industrial Teacher Education*, 44(4), 29–41.
- Donelan, H., Kear, K., & Ramage, M. (2012). *Online communication and collaboration: A reader*. Routledge.
- Driscoll, M. P. (2000). *Psychology of learning for instruction*. Boston: Allyn and Bacon, c2000.
- Duffy, P. (2008). Engaging the YouTube Google-eyed generation: Strategies for using Web 2.0 in teaching and learning. *Electronic Journal of E-Learning*, 6(2), 119–130.
- Ekoto, C. E., & Gaikwad, P. (2015). The Impact of Andragogy on learning satisfaction of graduate students. *American Journal of Educational Research, American Journal of Educational Research*, 3(11), 1378–1386.
- Elevate learning in higher education. (2018). Retrieved from https://edu.google.com/higher-ed-solutions/?modal_active=none
- Erturk, E. (2016). Using a cloud based collaboration technology in a systems analysis and design course. *International Journal of Emerging Technologies in Learning*, 11(1), 33–37.
- Farrel, D., Ray, K., Rich, T., Suarez, Z., Christenson, B., & Jennigs, L. (2018). A meta-analysis of approaches to engage social work students online. *Journal of Teaching in Social Work*, 38(2), 183–197.
- Fralinger, B., & Owens, R. (2009). You Tube as a learning tool. *Journal of College Teaching & Learning (TLC)*, 6(8).

- Franklin, T., & Harmelen, M. (2007). *Web 2.0 for content for learning and teaching in higher education*. Retrieved from <https://staff.blog.ui.ac.id/harrybs/files/2008/10/web-2-for-content-for-learning-and-teaching-in-higher-education.pdf>
- Gunter, G. A., & Gunter, R. E. (2014). *Teachers discovering computers: Integrating technology in a changing world* (8th ed.). Cengage Learning.
- Hadjerrouit, S. (2013). Collaborative writing with wikis: Pedagogical and technological implications for successful implementation in teacher education. In D. G. Sampson, P. Isaias, D. Ifenthaler, & J. M. Spector (Eds.), *Ubiquitous and mobile learning in the digital age* (pp. 173–189). Springer, New York, NY.
- Hair, J., Hult, G., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd Edition). Thousand Oaks: Sage.
- Hamdan, A. K. (2014). The reciprocal and correlative relationship between learning culture and online education: A case from Saudi Arabia. *International Review of Research in Open and Distance Learning*, 15(1), 309–336.
- Harpe, S. E. (2015). How to analyze Likert and other rating scale data. *Currents in Pharmacy Teaching and Learning*, 7(6), 836–850.
- Hartshorne, R., Ajjan, H., & Ferdig, R. (2010). Faculty use and perceptions of Web 2.0 in higher education. In H. Yang & S. Yuen (Eds.), *Handbook of research on practices and outcomes in e-learning: Issues and trends* (pp. 241–259). Hershey, PA: Information Science Reference.
- Hartshorne, R., & Ajjan, H. (2009). Examining student decisions to adopt Web 2.0 technologies: Theory and empirical tests. *Journal of Computing in Higher Education*, 21(3), 183.

- Higher education statistics. (2017). The Saudi Ministry of Education. Retrieved from <https://departments.moe.gov.sa/PLANNINGINFORMATION/RELATEDDEPARTMENTS/EDUCATIONSTATISTICSCENTER/EDUCATIONDETAILEDREPORTS/Pages/default.aspx>
- Isakovic, A. A., & McNaught, A. (2013). Supporting learning through the use of self-reflection blogs: A study of the experience of blended learning students in the United Arab Emirates. *Open Praxis, 5*(4), 355–363.
- Jackling, B., Natoli, R., Siddique, S., & Sciulli, N. (2015). Student attitudes to blogs: A case study of reflective and collaborative learning. *Assessment & Evaluation in Higher Education, 40*(4), 542–556.
- Jang, Y. (2015). Convenience matters: A qualitative study on the impact of use of social media and collaboration technologies on learning experience and performance in higher education. *Education for Information, 31*(1,2), 73–98.
- John, S. P. (2015). The integration of information technology in higher education: A study of faculty's attitude towards IT adoption in the teaching process. *Contaduría y Administración, 60*, 230–252.
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons, 53*(1), 59–68.
- Karvounidis, T., Chimos, K., Bersimis, S., & Douligeris, C. (2014). Evaluating Web 2.0 technologies in higher education using students' perceptions and performance. *Journal of Computer Assisted Learning, 30*(6), 577–596.

- Kassens-Noor, E. (2012). Twitter as a teaching practice to enhance active and informal learning in higher education: The case of sustainable tweets. *Active Learning in Higher Education, 13*(1), 9–21.
- Kear, K., Donelan, H., & Williams, J. (2014). Using wikis for online group projects: Student and tutor perspectives. *International Review of Research in Open and Distance Learning, 15*(4), 70–90.
- Keengwe, J., Kidd, T., & Kyei-Blankson, L. (2009). Faculty and technology: Implications for faculty training and technology leadership. *Journal of Science Education and Technology, 18*(1), 23–28.
- Ken Kwong-Kay Wong. (2013). Partial Least Squares Structural Equation Modeling (PLS-SEM) techniques using SmartPLS. *Marketing Bulletin, 24*, 1–32.
- Khawaji, T. M. N. (2016). *Web 2.0 technology: Social learning tools in higher education in Saudi Arabia* (Doctoral thesis, Queensland University of Technology, Brisbane, Queensland, Australia). Retrieved from <http://eprints.qut.edu.au/93426/>
- Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. Englewood Cliffs, NJ: Cambridge Adult Education.
- Konstantinidis, A., Theodostadou, D., & Pappos, C. (2013). Web 2.0 tools for supporting teaching. *Turkish Online Journal of Distance Education, 14*(4), 287–295.
- Lei, C. U., Tomas, K., Zhang, N., Wan, K., & Man, K. L. (2012). Using Web 2.0 tools to enhance learning in higher education: A case study in technological education. *Proceedings of the International MultiConference of Engineers & Computer Scientists 2012 Volume II*, Hong Kong.

- Li, L., & Pitts, J. P. (2009). Does it really matter? Using virtual office hours to enhance student-faculty interaction. *Journal of Information Systems Education*, 20(2), 175–185.
- Lin, M. H., Li, J. J., Hung, P. Y., & Huang, H.-W. (2014). Blogging a journal: Changing students' writing skills and perceptions. *ELT Journal: English Language Teaching Journal*, 68(4), 422–431.
- Mason, L. L. (2016). *Are we ready to Web 2.0? Web 2.0 in higher education classrooms* (Doctoral dissertation, Wilmington University). Retrieved from: <https://search.proquest.com/docview/1782296776>
- McLoughlin, C., & Lee, M. (2007). Social software and participatory learning: Pedagogical choices with technology affordances in the Web 2.0 era. *Faculty of Education and Arts Publications*, 664–675.
- Messner, M., Medina-Messner, V., & Guidry, J. (2016). Global health and social media: Using Instagram and Twitter in an open online class for global service-learning projects. *Communication Teacher*, 30(4), 185–189.
- Mills, G. E., & Gay, L. R. (2016). *Educational research : Competencies for analysis and applications*. Boston : Pearson.
- Moghavvemi, S., Sulaiman, A., Jaafar, N. I., & Kasem, N. (2018). Social media as a complementary learning tool for teaching and learning: The case of youtube. *The International Journal of Management Education*, 16(1), 37–42.
- Naveen, C., & Nagesh, R. (2017). Use of social media & its impact on academic performance of engineering students: A study. *Library of Progress-Library Science, Information Technology & Computer*, 37(2), 154–163.

- Novakovich, J. (2016). Fostering critical thinking and reflection through blog-mediated peer feedback. *Journal of Computer Assisted Learning*, 32(1), 16–30.
- Orehovacki, T., Bubas, G., & Konecki, M. (2009). Web 2.0 in education and potential factors of Web 2.0 use by students of information systems. *Proceedings of the ITI 2009 31st International Conference on Information Technology Interfaces, Dubrovnik, Croatia*.
- O'Reilly, T. (2005). What is Web 2.0: Design patterns and business models for the next generation of software. Retrieved from <https://www.oreilly.com/pub/a/web2/archive/what-is-web-20.html>
- Orndorff, H. N. (2015). Collaborative note-taking: The impact of cloud computing on classroom performance. *International Journal of Teaching and Learning in Higher Education*, 27(3), 340–351.
- Osika, E., Johnson, R., & Butea, R. (2009). Factors influencing faculty use of technology in online instruction: A case study. *Online Journal of Distance Learning Administration*, 12(1). Retrieved from <https://www.westga.edu/~distance/ojdla/spring121/osika121.html>
- Page, G. A., & Ali, R. (2009). The power and promise of Web 2.0 tools. In C. R. Payn (Ed.), *Information technology and constructivism in higher education: Progressive learning frameworks* (pp. 146–158). Hershey, PA: Information Science Reference.
- Paver, J., Walker, D. A., & Hung, W. C. (2014). Factors that predict the integration of technology for instruction by community college adjunct faculty. *Community College Journal of Research and Practice*, 38(1), 68–85.
- Perception. (2019). *Oxford dictionaries*. Retrieved from <https://en.oxforddictionaries.com/definition/perception>

- Ramli, R. M. (2014). A Study on the use of Facebook, RSS, Blogs and Twitter (Web2.0) among selected academic libraries from 6 Gulf countries namely: Kingdom of Saudi Arabia, United Arab Emirates, Qatar, Bahrain, Oman and Kuwait. *Proceedings of QScience, Saudi Arabia*.
- Reid, P. (2014). Categories for barriers to adoption of instructional technologies. *Education and Information Technologies, 19(2)*, 383–407.
- Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing, 26(4)*, 332–344.
- Rich, M. (2008). Millennial students and technology choices for information searching. *Electronic Journal of Business Research Methods, 6(1)*, 73–76.
- Ringle, C., Wende, S., & Becker, J. (2015). SmartPLS 3. (Version 3.2.6). Boenningstedt, Germany: SmartPLS GmbH. Retrieved from <http://www.smartpls.com>
- Rogers-Estable, M. (2014). Web 2.0 use in higher education. *European Journal of Open, Distance and E-Learning, 17(2)*, 130–142.
- Sadaf, A., Newby, T. J., & Ertmer, P. A. (2013). Exploring factors that predict preservice teachers' intentions to use Web 2.0 technologies using Decomposed Theory of Planned Behavior. *Journal of Research on Technology in Education, 45(2)*, 171–196.
- Sadik, A. (2017). Students' acceptance of file sharing systems as a tool for sharing course materials: The case of Google Drive. *Education and Information Technologies, 22(5)*, 2455–2470.
- Salem, F. (2017). *Social media and the Internet of things: Towards data-driven policymaking in the Arab world* (The Arab Social Media Report No. 7). Dubai, UAE: MBR School of

- Government. Retrieved from <https://www.mbrsg.ae/home/publications/research-report-research-paper-white-paper/arab-social-media-report-2017.aspx>
- Salomon, D. (2013). Moving on from Facebook: Using Instagram to connect with undergraduates and engage in teaching and learning. *College & Research Libraries News*, 74(8), 408–412.
- Sekaran, U. (2005). *Research methods for business - a skill building approach* (4th ed.). New York: Wiley.
- Selwyn, N. (2007). *Web 2.0 applications as alternative environments for informal learning - A critical review*. Paper presented at the OECD-KERIS expert meeting - Session 6 - Alternative learning environments in practice: using ICT to change impact and outcomes, Cheju Island, South Korea. Retrieved from <http://newinbre.hpcf.upr.edu/wp-content/uploads/2017/02/39458556-W2-informal-learning.pdf>
- Seo, K. K. J. (Ed.). (2013). *Using social media effectively in the classroom : Blogs, wikis, twitter, and more*. New York : Routledge.
- Shang, S. S., Li, E. Y., Wu, Y. L., & Hou, O. C. (2011). Understanding Web 2.0 service models: A knowledge-creating perspective. *Information & Management*, 48(4), 178–184.
- Smaldino, S. E., Lowther, D. L., & Russell, J. D. (2012). *Instructional technology and media for learning*. Upper Saddle River, N.J. : Pearson Merrill Prentice Hall.
- So, S. (2016). Mobile instant messaging support for teaching and learning in higher education. *The Internet and Higher Education*, 31, 32–42.
- Soomro, K. A., Zai, S. Y., & Jafri, I. H. (2015). Competence and usage of Web 2.0 technologies by higher education faculty. *Educational Media International*, 52(4), 284–295.

- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston, MA: Allyn & Bacon/Pearson Education.
- Tang, Y., & Hew, K. F. (2017). Is mobile instant messaging (MIM) useful in education? Examining its technological, pedagogical, and social affordances. *Educational Research Review, 21*, 85–104.
- Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research, 6*(2), 144–176.
- The current status of higher education in the Kingdom of Saudi Arabia. (2011). Retrieved from <https://www.mohe.gov.sa/en/Ministry/General-administration-for-Public-relations/BooksList/stat7eng.pdf>
- Tunks, K. W. (2012). An Introduction and guide to enhancing online instruction with Web 2.0 tools. *Journal of Educators Online, 9*(2).
- Wang, L. C., & Morgan, W. R. (2008). Student perceptions of using instant messaging software to facilitate synchronous online class interaction in a graduate teacher education course. *Journal of Computing in Teacher Education, 25*(1), 15–21.
- Weber, A. S. (2013). Cloud computing in education. In D. G. Sampson, P. Isaias, D. Ifenthaler, & J. M. Spector (Eds.), *Ubiquitous and Mobile Learning in the Digital Age* (pp. 19–36). Springer, New York, NY.
- Wook, M., Yusof, Z. M., & Nazri, M. Z. A. (2017). Educational data mining acceptance among undergraduate students. *Education and Information Technologies, 22*(3), 1195–1216.
- Zelick, S. A. (2013). *The perception of Web 2.0 technologies on teaching and learning in higher education: A case study* (Doctoral dissertation, Capella University). Retrieved

from

<https://search.proquest.com/docview/1412660218/abstract/736A8CD9F33467CPQ/1>

Zheng, B., Niiya, M., & Warschauer, M. (2015). Wikis and collaborative learning in higher education. *Technology, Pedagogy and Education, 24*(3), 357–374.

Zoumenou, V., Sigman-Grant, M., Coleman, G., Malekian, F., Zee, J. M. K., Fountain, B. J., & Marsh, A. (2015). Identifying best practices for an interactive webinar. *Journal of Family & Consumer Sciences, 107*(2), 62–69.