

Determining Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at
Multiple Saudi Arabia Universities.

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ABSTRACT

With the spread of synchronous and asynchronous online teaching tools, it has become necessary to identify factors and challenges influencing faculty member adoption of online teaching into teaching practice at Saudi universities. The parallel convergent mixed method was used as the methodology for this study and was conducted in three Saudi universities; Imam Abdulrahman bin Faisal University, King Faisal University, and University of Bisha. The total number of responses from the study instrument was about 124; Imam Abdulrahman bin Faisal University 49, King Faisal University 41, and the University of Bisha 34. The theoretical framework for this study was the Decomposed Theory of Planned Behavior (DTPB) modal. The collection of quantitative and qualitative data as convergent parallel mixed methods was in one phase and concurrently included close-ended and open-ended questions. The data were separately analyzed quantitative and qualitative. The questionnaire instrument was constructed in four parts: (1) faculty demographic information, (2) technologies faculty use most with online teaching, (3) the use of online teaching and learning tools, and (4) utilization of online tools. The first and second sections of the survey instrument were focused on faculty demographics such as gender, age, academic rank, teaching experiences, department or college, nationality, type of contract, and years of experience teaching online courses. Additional information about faculty's most used technologies (such as possession of personal home technology tools, provision of a university

office computer, connection to the Internet at a university, and connection to the Internet at home) for online teaching were also collected. Items pertaining to faculty perceptions of challenges associated with using online teaching tools in their teaching practice were also included in the second section of the survey. A 5-point Likert-scale was used for participant responses with 5=Always, 4=Mostly, 3=Moderate, 2=Seldom, and 1=Never. The findings of faculty demographic information and the type of technologies faculty uses most with online teaching that the quantitative findings of the ANOVA for the first part of the analysis, there were no significant differences identified for gender, faculty members' academic rank and experience, nationality, and contract types in relation to the use of university-provided resources for online teaching tools. However, significant differences were found among faculty members based on age, university departments or colleges, and the experience levels of faculty members for using university-provided resources for online teaching tools. In the second part of the ANOVA analysis, which involved comparisons of the variables, there were no significant differences found based on faculty members' age, university, academic rank or experience level, or gender to use a personal digital resource at home. However, the findings from the ANOVA analysis indicated that there were significant differences found for faculty and using personal digital resources. Differences were found between the three different university contract types. Specifically, faculty with non-renewable contracts were found to use personal resources more than those with renewable contracts. Additionally, differences were also found based on nationality, in that Saudi faculty use significantly more personal resources. For the use of online teaching and learning tool's part based on Decomposed Theory of Planned Behavior (DTPB) modal to the attitude, subjective norms, and perceived behavioral control. The attitude findings

of the qualitative faculty members indicated that their choices to engage with online teaching tools were greatly influenced by the perceived usefulness of online teaching during COVID-19. This was related to their flexible and interactive nature. Additionally, the quantitative findings showed that the perceived usefulness was significantly impacted by faculty attitudes toward using online tools in their teaching practices. The findings that qualitative findings from this study revealed the individual intentions of faculty in terms of selecting online and digital tools for online instruction that was based on their assessments of expected difficulty toward the outcomes of intended behavior. However, the quantitative findings indicated that peer influence, student influence, and superior influence were significant factors affecting faculty members' subjective norms. Finally, the quantitative findings of perceived behavioral control indicated the significance of facilitating conditions, technology, and resources as factors that affect faculty members' behavioral control over online teaching in this study. The qualitative result indicated that faculty members were engaged in online teaching positively despite the difficulties and challenges and perceived significant usefulness in utilizing various online and digital teaching tools.

Determining Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabia Universities.

Monerah Abdulrahman Alduwairaj

GENERAL AUDIENCE ABSTRACT

This descriptive study investigated the factors and challenges influencing faculty member adoption of online teaching into teaching practice at Saudi universities. This study aims to (1) identify whether the differences that exist in Saudi faculty members' use of online tools can be associated with factors such as gender, age, academic rank, teaching experience, department or college, nationality, type of contract, possession of personal online and digital tools at home, provision of a university office with online and digital tools, connection to the Internet at a university, and connection to the Internet at home, (2) determine the perceived advantages and disadvantages for faculty members using online teaching in the instructional process, (3) determine perceived challenges for faculty members using online teaching in the instructional process. The parallel convergent mixed method was used as the methodology for this study and was conducted in three Saudi universities; Imam Abdulrahman bin Faisal University, King Faisal University, and University of Bisha. The total number of responses from the study instrument was about 124; Imam Abdulrahman bin Faisal University 49, King Faisal University 41, and the University of Bisha 34. The theoretical framework for this study was the Decomposed Theory of Planned Behavior (DTPB) modal. The collection of quantitative and qualitative data as convergent parallel mixed methods was in one phase and concurrently included close-ended and open-ended questions. However, both quantitative and qualitative findings indicated that their

choices to engage with online teaching tools were greatly influenced by the perceived usefulness of online teaching during COVID-19 and the perceived usefulness was significantly impacted by faculty members' attitudes. The qualitative findings from this study revealed the individual intentions of faculty in terms of selecting online and digital tools for online instruction. This was based on their assessments of expected difficulty toward the outcomes of intended behavior (Yao et al., 2022). For example, faculty members indicated that they used online teaching tools because such tools were easy to operate and provided ample opportunity to interact with several students at the same time. However, faculty members also indicated perceived difficulty and complexity associated with online digital tools. On the other hand, quantitative findings indicated that peer influence, student influence, and superior influence were significant factors affecting faculty members' subjective norms. Finally, the findings from this study indicated that faculty members were engaged in online teaching positively despite the difficulties and challenges. However, they perceived significant usefulness in utilizing various online and digital teaching tools.

DEDICATION

To My Beloved Father and Mother:

Thank you. I dedicate the harvest of my work to your perpetual love, care, and tender hands that have always supported me towards achieving my academic future.

To My Dear and Loving Husband, Abdulrahman Alammar:

I appreciate your patience, encouragement, and ongoing assistance. I appreciate all you did to make this difficult journey more manageable while sharing everything with me. You have made it possible.

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TABLE OF CONTENTS

ABSTRACT.....	ii
DEDICATION.....	iv
ACKNOWLEDGMENTS	v
CHAPTER 1	1
BACKGROUND AND PROBLEM STATEMENT	1
Introduction.....	1
Problem Statement.....	3
Purpose of the Study	4
Research Questions.....	5
Benefits of the Study.....	5
Definition of Terms.....	6
Adoption of Online Teaching.	6
Attitude.	6
Asynchronous learning.	6
Convergent Parallel Design.	7
Digital Resources for Learning.....	7
Distance Learning.	7
E-learning.....	7

Faculty Members	7
Instructional Preparation.....	7
Intentions.....	7
Learning Management Systems (LMS).....	8
Mixed Method.....	8
Online Teaching.....	8
Online Instructional Delivery.	8
Perceived Behavioral Control.	8
Perceived Usefulness.	8
Synchronous Learning	8
Subjective Norms.....	8
Summary.....	9
CHAPTER 2	10
LITERATURE REVIEW	10
Introduction.....	10
Saudi Arabia's Higher Education System: A Brief Overview	10
Definition of Online Teaching Tools.....	12
The Beginning Use of Internet and Computers in Saudi Arabia	13
Institutions in Saudi Arabia's Adoption of Distance Learning in Higher Education.....	15
Faculty Attitudes Towards Technologies and Online Teaching in Saudi Arabia.....	17

Universities of the Eastern Region Associated with the Study.....	19
Imam Abdulrahman bin Faisal University (IAU).....	19
King Faisal University (KFU)	20
University of Bisha (UB).....	20
Demographic Variables Related to Adopting Online Teaching by Faculty Members	21
Gender.....	21
Age and Teaching Experience	22
Academic Rank, Nationality, Type of Contract, and Disciplines.....	22
Faculty Advantages Associated with Adoption of Online Teaching Tools.....	24
Flexibility of Access	24
Collaboration and Communication.....	24
Assessment.....	25
Faculty Challenges Associated with Adoption of Online Teaching Tools in Higher Education	26
Self-efficacy	26
Faculty Anxiety.....	27
Faculty Training.....	27
The Decomposed Theory of Planned Behavior	28
Attitude	30
Subjective Norms.....	30

Perceived Behavioral Control.....	30
Summary.....	31
CHAPTER 3	33
RESEARCH METHODOLOGY.....	33
Introduction.....	33
Research Design.....	33
Mixed Methods Design.....	34
Research Setting.....	36
Research Procedures	36
The Instrument.....	39
Description of the Variables	46
Reliability and Validity.....	46
Data Collection	48
Data Analysis	49
Summary.....	51
CHAPTER 4	52
MIXED METHODS DATA ANALYSIS	52
Introduction.....	52
Research Questions.....	52
Descriptive Statistics.....	52

Demographics (Quantitative).....	53
Percentage of Participants by University	53
Gender.....	53
Age.....	54
Academic Rank.....	55
Teaching Experience.....	56
Department or College.....	57
Nationality.....	57
Type of Contract	58
Use of Online Teaching Tools and Digital Devices for Instructional Preparation at the Three Universities	59
Use of Online Teaching Tools and Digital Devices for Instructional Delivery at the Three Universities	61
Access to Digital Resources for Instructional Delivery at the Three Universities	65
Quantitative Analysis (Research Question 1).....	66
Comparison of Use of University-Provided Resources in Online Teaching	66
Group Comparisons by Age for Using University-Provided Teaching Digital Resources ..	67
Group Comparisons by University and Department for Using University-Provided Resources	68
Group Comparisons by Academic Rank and Teaching Experience for Using University-Provided Resources.....	69

Group Comparison by Gender, Nationality, and Contract of Type for Using University- Provided Resources.....	70
Comparison of Use of Personal Digital Resources for Online Teaching	70
Group Comparisons by Age for Using Personal Resources	71
Group Comparisons by University and Faculty Type for Using Personal Resources.....	71
Group Comparisons by Faculty Rank and Experience for Using Personal Resources.....	72
Group Comparison by Faculty Nationality and Contract Type for Using Personal Resources	73
Quantitative Analysis (Research Question 2).....	73
Perceived Usage of Online Resources	74
Frequency Counts for Perceived Usage of Online Teaching Resources	77
Qualitative Analysis (Research Question 3).....	79
Qualitative Question 1 (Section Two of the Instrument).....	80
Categories for Online Teaching Experiences in Preparing Online Instruction.....	80
Qualitative Question 2 (Section Two of the Instrument).....	84
Categories of Online Teaching Experiences for Delivering Online Instruction.....	84
Qualitative Questions 1, 2, 3, 4, 5 (Section Four of the Instrument).....	86
Description of Categories for Advantages Related to Online Teaching Tools.....	86
Description of Categories for Disadvantages of Online Teaching Tools	88
Description of Categories for Challenges Related to Online Teaching Tools.....	90

Description of Categories for Benefits Related to Preparation for Online Teaching	92
Description of Categories for Benefits of Online Instructional Delivery	94
CHAPTER 5	96
INTERPRETATION DATA AND DISCUSSION FINDING.....	96
Summary.....	96
Research Hypothesis.....	96
Discussion of the Findings.....	97
Research Question 1	97
Online Teaching Tools for Instruction Preparation and Delivery.	100
Use of Personal and University-Provided Internet Tools.	101
Research Questions 2 and 3	101
Interpretation of Quantitative and Qualitative Data.....	101
Attitude.	106
Subjective Norms.....	107
Perceived Behavioral Control.	108
Study Limitations.....	108
Recommendations for Faculty Members to Enhance the Use of Online Teaching Tools Within Their Teaching Practices.....	110
Preparing and Delivering Instruction.....	110
Difficulties and Challenges.....	111

Perceived Usefulness	111
Subjective Norms.....	112
University Motivation.....	112
Recommendations for Future Study	112
Conclusion	113
References.....	115
APPENDICES	136
Appendix A: Consent Form English Language	137
Appendix B: Survey English Language.....	139
Appendix C: Consent Form Arabic Language	147
Appendix D: Survey Arabic Language	149
Appendix E: English Email to Faculty Members	159
Appendix F: Arabic Email to Faculty Members	160
Appendix G: Virginia Tech IRB Permission.....	161
Appendix H: Imam Abdulrahman bin Faisal University Permission	162
Appendix I: King Faisal University Permission	164
Appendix J: University of Bisha Permission	165
Appendix K: Section 3 of the Instrument Permission	166
Appendix L: Figure Permission	167
Appendix M: Code Book for Qualitative Data Analyzed	168

LIST OF FIGURES

Figure 1: Convergent Parallel Mixed Method	36
Figure 2: Flowchart of Implement the Convergent Parallel Mixed methods Procedure and Steps for this Study.....	37

LIST OF TABLES

Table 1: The Constructs and Items of Section 3	41
Table 2: Reliability Analysis of Online Teaching and Learning Tools	47
Table 3: Percentage of Participants by University.....	53
Table 4: Gender.....	53
Table 5: Age.....	54
Table 6: Academic Rank.....	55
Table 7: Teaching Experience	56
Table 8: Department or College.....	57
Table 9: Nationality	57
Table 10: Type of Contract.....	58
Table 11: Use of Online Teaching Tools and Digital Devices for Instructional Preparation at the Three Universities.....	59
Table 12: Use of Online Teaching Tools and Digital Devices for Instructional Delivery at the Three Universities.....	61
Table 13: Access to Digital Resources for Instructional Preparation at the Three Universities...	63
Table 14: Access to Digital Resources for Instructional Delivery at the Three Universities	65
Table 15: Group Comparisons by Age for Using University-Provided Teaching Digital Resources	67
Table 16: Group Comparisons by University and Department for Using University-Provided Resources	68

Table 17: Group Comparisons by Academic Rank and Teaching Experience for Using University-Provided Resources	69
Table 18: Group Comparison by Gender, Nationality, and Contract of Type for Using University-Provided Resources	70
Table 19: Group Comparisons by Age for Using Personal Resources.....	71
Table 20: Group Comparisons by University and Faculty Type for Using Personal Resources..	71
Table 21: Group Comparisons by Faculty Rank and Experience for Using Personal Resources	72
Table 22: Group Comparison by Faculty Nationality and Contract Type for Using Personal Resources	73
Table 23: Perceived Usage of Online Resources.....	74
Table 24: Frequency Counts for Perceived Usage of Online Teaching Resources	77
Table 25: Categories for Online Teaching Experiences in Preparing Online Instruction	80
Table 26: Categories of Online Teaching Experiences for Delivering Online Instruction.....	84
Table 27: Description of Categories for Advantages Related to Online Teaching Tools	86
Table 28: Description of Categories for Disadvantages of Online Teaching Tools.....	88
Table 29: Description of Categories for Challenges Related to Online Teaching Tools.....	90
Table 30: Description of Categories for Benefits Related to Preparation for Online Teaching...	92
Table 31: Description of Categories for Benefits of Online Instructional Delivery.....	94
Table 32: Comparison of Quantitative and Qualitative Use of Online Teaching Tools.....	103

CHAPTER 1

BACKGROUND AND PROBLEM STATEMENT

Introduction

The increase in the use of technology at learning institutions stems from the fact that current generations exist in a digital world. Technology has been critical in facilitating collaboration within campus communities in the acquisition of information, connection with peers, and providing a competitive edge in future careers. Roselle and Pinholster (1999) explained that technology usage between educators and students in higher education can help students to, “develop multiple skills such as communication skills, mastery of analytical thinking, teamwork, independent learning, and strategies for making the best use of all available resources” (p. 17). It is possible for technology to support instruction and teaching practices in a variety of ways. Faculty usage of technology helps to enhance teaching practice through encouraging positive learning and presenting concepts in different formats via gaming, online classroom activities, multimedia presentations, and creating blogs or wiki (Lebenicnik Li et al., 2015; Lee & Markcy, 2014). With the role of the Internet and technology being vital in higher education today, that should be considered carefully when looking to the future of education (Shaw & Polovina, 1999). The Internet has become an important learning tool, and has changed communication between faculty and students, allowing them to contact one another at any time and from any place (Bates & Sangrà, 2011, p. 31).

The increased utilization of technology tools has prompted the importance of implementing the Internet and online teaching tools in higher education throughout the teaching and learning process. Perhaps as a result, higher education initiatives strive to provide students and faculty with increased access to varied educational opportunities such as online teaching and

learning (Allen & Seaman, 2008; Saba, 2005; Keengwe & Kidd, 2010). Online teaching is defined as the process of utilizing technology tools to service the learning process through access to the Internet. For example, online course materials can be accessed and used from a computer, phone, or handheld device to deliver learning and instruction (Guri-Rosenblit, 2005; Li et al., 2009; Koohang & Harman, 2005). In the early 1990s online teaching and learning were adopted in Saudi Arabia, and enhanced by the extensive use of computer devices and technology tools (Al-Masaud & Gawad, 2014).

In 1954, the Ministry of Education (MOE) in the Kingdom of Saudi Arabia was founded. (Ministry of Education, 2007). In general, education in Saudi Arabia is cost-free from kindergarten through higher education, inclusive of private education. However, free higher education is exclusively available to Saudi citizens, which provides limited opportunities for international students. Saudi citizens receive stipends from the Ministry of Education when they decide to pursue higher education (Alamri, 2011). Alamri (2011) has clarified the function of the (MOE) in Saudi Arabia by describing it as, “a centralized authority responsible for directing university education in accordance with the adopted policy, supervising the development of university education in all sectors, coordinating among universities especially in the field of scientific departments and degrees, encouraging research, and formulating rules and regulations for compliance by all institutions of higher learning” (p. 89). It is also worth noting that Saudi higher education separates male and female students into separate campuses, but that the health sector is excluded (for example, at King Abdullah University of Science and Technology). Additionally, the universities in Saudi Arabia are divided and distributed geographically among the cities of the Saudi Arabian kingdom within various regions. There are approximately 29

public universities in Saudi Arabia, and the number of private universities is approximately 38 (Ministry of Education, 2019).

The growing importance of e-learning in the Kingdom of Saudi Arabia has resulted in the creation of a National Center for E-learning and Distance Learning. In 2007, the NCED was created for utilizing technology tools and platforms to increase the qualifications of faculty and the administration, and to support the educational technology and practice for higher education institutions (Alhabeeb & Rowley, 2017). This indicates that the Saudi Arabian government has been attentive to developing e-learning, improving faculty and administrator skills through providing training agencies, and controlling the quality of online teaching and learning in universities that are both public and private. Despite this development, there are challenges and limitations to Saudi Arabia's higher education institutions for the adoption of online teaching. For example, one study indicates that 30% to 40% of faculty and students had some level of dissatisfaction with the use of online teaching and learning in either method or content (Alkhalaf et al., 2012).

Problem Statement

The government of Saudi Arabia has realized that it is necessary to develop the higher education institutions system to a global level due to the significant increase in access to higher education over different disciplines (Smith & Abouammoh, 2013). The Ministry of Education (MOE) in Saudi Arabia has published their plan to keep pace with the new vision 2030, enabling it to meet challenges and develop goals. The MOE (2016) has found that it is necessary to adopt new technologies to promote the efficiency of teaching performance and the educational work system. In response to these challenges, the MOE has established the National Transformation

Program, and developed a plan to improve the higher education and teaching systems. The program aims to complete its goals and vision by 2030.

Still, the decision to adopt online courses into Saudi Arabian higher institutions is mostly in the hands of the faculty members. It has been observed that groups of faculty members across Saudi Arabian universities have negative attitudes toward technologies such as the Internet, E-learning, or Learning Management Systems (LMS). In particular, Alenezi (2012) conducted a study that found that some faculty members with negative attitudes towards E-learning perceive that online teaching places value on memorization rather than authentic learning. The faculty in the study felt that the E-learning environment reduced student opportunities for creativity (Alenezi, 2012). Moreover, levels of teaching experience and computer skill both play major roles in faculty members' perceptions of using e-learning (Al-Sadoon, 2009). Previous studies have also shown that there are faculty gender differences within e-learning that relate to the level of comfort, perception, ease of use, and reactions when adopting an e-learning platform (Al-balawi, 2000; Kim & Forsyth, 2008; Morris et al., 2005; Park et al., 2007; Arenas-Gaitán et al., 2010). Consequently, the problem of this study focuses on the factors and challenges that influence faculty decisions to adopt online teaching, and how complex it is to adopt by faculty members into teaching practice within Saudi Arabian higher education.

Purpose of the Study

This convergent parallel mixed methods descriptive study had several objectives. These objectives were to (1) describe the differences based on factors such as gender, age, academic rank, teaching experiences, department or college, nationality, type of contract, possession of personal online and digital tools at home, provision of a university office with online and digital tools, connection to the Internet at a university, and connection to the Internet at home, that may

affect faculty member adoption of online courses into their teaching practice, (2) determine the perceived advantages and disadvantages for faculty members using online teaching in the instructional process, such as those related to preparing and delivering instruction, (3) identify the challenges faced by faculty members in adopting online teaching when preparing and delivering online instruction. This research incorporated the Decomposed Theory of Planned Behavior (DPTB). According to Ajzen (1991), The Theory of Planned Behavior involves three conceptually independent determinants of intention which are: attitudes toward the behavior, social factors or subjective norms, and perceived behavioral control. These determinants indicate the perceived ease or difficulty of performing the behavior, reflecting on experience as well as expected barriers and obstacles. A secondary purpose of this mixed-methods study was to enrich Saudi Arabian educational literature related to online teaching.

Research Questions

The study is designed to answer the three quantitative and qualitative questions:

- 1- What differences in Saudi faculty members' use of online tools can be associated with demographic variables (gender, age, academic rank, teaching experiences, department or college, nationality, type of contract, possession of home technology tools, provision of a university office computer, connection to the Internet at a university, and connection to the Internet at home)?
- 2- What are the perceived opportunities for faculty members using online teaching in the instructional process?
- 3- How do faculty members rate the perceived challenges associated with using online teaching in the instructional process?

Benefits of the Study

Online teaching is playing an effective role in the teaching and learning process within the Kingdom of Saudi Arabia. Recently, both asynchronous and synchronous online teaching have been drastically increased at higher education universities in Saudi Arabia (Al-Shehri, 2005; Aljaber, 2018). This is especially true after the urgency of adoption associated with the global COVID- 19 pandemic. Due to the global pandemic, the Saudi Ministry of Education was led to announce a transfer to online classes to continue the learning process in a safe manner. During this time, all universities and institutions were shifted to online teaching and learning formats (Khalil et al., 2020). This generates huge significance for the current study since there is a current need for more investigations of online teaching. This is particularly true given the possibility of increased usage of internet resources in the teaching and learning process in the wake of the pandemic. The results from this study may assist faculty members in the future, increasing their knowledge of the challenges and complexities they might face while using online teaching in asynchronous or synchronous ways.

Definition of Terms

Adoption of Online Teaching. The adoption of online teaching is defined as online education by Paulsen (2002) as the presentation or distribution of instructional content through computer networks, with the provision of a pupil's access to a two-way computer network connection so they can interact with staff, teachers, and other students.

Attitude. Attitudes are defined in psychology via assessing a grade based on the degree of acceptance or unacceptance (Eagly & Chaiken, 1993).

Asynchronous learning. Asynchronous learning is the utilization of technology tools and learning platforms to provide content and enhance the learning process. Learners and educators do not connect and access the Internet at the same time (Bianchi-Laubsch, 2014).

Convergent Parallel Design. Convergent parallel design is one of the mixed methods methodologies. This design involves a concurrent collection period to gather quantitative and qualitative data. Analyses for both data sets occur independently, but results are later mixed and converged in the discussion and interpretation (Creswell, 2021).

Digital Resources for Learning. The digital learning tools were created to supplement traditional educational methods by serving as an educator's replacement in the context of knowledge transfer (Churchill, 2017).

Distance Learning. The definition of distance learning is instructional contact (the learning and teaching process) that occurs in various times and places through the use of multimedia technologies (Moore & Kearsley, 2012; King et al., 2001).

E-learning. The definition of E-learning used for this study was developed by the Higher Education Funding Council for England (HEFCE). E-learning is described by HEFCE as the utilization of technologies in learning choices, and the use of these tools to deliver information. Technologies can also be used for communication between individuals and groups, which assists students and develops the administration of learning (HEFCE, 2005).

Faculty Members. This encompasses academic personnel who teach and/or perform research, librarians, visiting and part-time professors, and advisors (Indiana University, n.d.).

Instructional Preparation. This is dependant on the educator, and involves creating or designing content in ways that allow students to benefit from the instructional content (Klafki, 2006).

Intentions. This is an indication of how hard an individual is willing to try, and how great an effort they are prepared to exercise to perform a behavior. In general, the behavior is more likely to occur if there is a strong intention to engage in it (Ajzen, 1991).

Learning Management Systems (LMS). The phrase "Learning Management System" is that used to describe the diverse systems that supply access to online courses for students, faculty, and administrators (Aldiab et al., 2019).

Mixed Method. The definition of mixed methods is merging the qualitative approaches and quantitative approaches together in a study (Fetters et al., 2013).

Online Teaching. The definition of online teaching is the use of the Internet and Internet-accessible tools for interactions between the educator, content, and students, which assists the learning process (Ally, 2002).

Online Instructional Delivery. Instructional materials may be delivered via print and digital media, and instructional delivery may have involved an educator that was not physically present with the student and who gave the lesson at different times (Moore, 1990; Moore, et al., 2011).

Perceived Behavioral Control. The phrase "Perceived Behavioral Control" involves building a behavioral intention, and may function as a representative for actual control (Ajzen, 2002).

Perceived Usefulness. The perceived usefulness of technology and "relative advantage" were used interchangeably in this study. The concept of relative advantage refers to how much innovation is thought to be superior to the concept it replaces. This is used more in describing technological innovation, and refers to individual awareness about the usefulness of technology (Rogers, 1983; Rogers, 2003).

Synchronous Learning. The definition of synchronous learning is the process of learning using technological means where learners and educators communicate at the same time (Bianchi-Laubsch, 2014).

Subjective Norms. A subjective norm is the individual's perception or belief related to others' anticipation of a specific manner in which someone shall or shall not act (Huda et al., 2012).

Summary

Chapter One has presented the introduction, problem statement, study purpose, study benefits, research questions, and definitions for important terms. It has also outlined the practical framework for this study, which examines factors and challenges that influence faculty members' decisions to adopt online teaching across different universities, disciplines, and experiences in Saudi Arabia. Chapter Two will present relevant literature on the higher education system in Saudi Arabia, the definition of online teaching, the use of internet and computers in the Kingdom of Saudi Arabia, faculty attitudes towards technologies and online teaching in Saudi Arabia, adoption of distance learning in higher education in Saudi Arabia, faculty advantages associated with the adoption of online teaching, demographic variables related to adopting distance learning by faculty members, faculty challenges associated with the adoption of online teaching in higher education, and The Decomposed Theory of Planned Behavior. The research design, mixed methods, research environment, research procedures, study instrument, the study description, reliability and validity, data collection, and data analysis are all covered in Chapter Three. Chapter Four presents the statistics and data analysis for each of the research questions, and includes both quantitative and qualitative portions. The data were analyzed for frequency, ANOVA, and percentage. Chapter Five offers the convergence of the quantitative and qualitative data that were collected to address the research questions, followed by a discussion of the findings and the recommendations and restrictions associated with this descriptive study.

CHAPTER 2

LITERATURE REVIEW

Introduction

This topic was chosen based on the increasing importance of faculty members using online teaching synchronously or asynchronously during the learning process. The study's main purpose was to investigate the factors and challenges that influence faculty decisions to adopt online tools into their teaching practice within Saudi Arabian higher education. This literature review summarizes several studies related to how faculty at Saudi Arabian higher education institutions have used online tools in the teaching and learning process. The review also includes an introduction to the types of distance learning that faculty members have used, and how online teaching has developed through the present day. The methodology and framework for this study was based on the Decomposed Theory of Planned Behavior (DPTB) designed by Taylor and Todd (1995).

Saudi Arabia's Higher Education System: A Brief Overview

The Supreme Council of Higher Education (SCHE) is the top authority in the Saudi higher education system according to the Ministry of Education (2001). The chairman of SCHE is the King of Saudi Arabia, who serves as prime minister. The Minister of Higher Education, university presidents, and representatives from other educational fields are additional SCHE members. Alkhazim (2003) clarifies that, "the council regulates several academic issues such as approving the establishment of or modifying any academic university program, appointing the vice-rectors for universities, approving collaboration agreements between Saudi universities and their international counterparts, etc" (p. 481).

In every country in the world, education has special characteristics and advantages, and the Kingdom of Saudi Arabia is no exception. A concentration on teaching Islam, a centralized system of education provided by government funding (school is free in Saudi Arabia for all grades), and the policy of gender separation are the cornerstones of Saudi education (Smith & Abouammoh, 2013). In addition, the Saudi Arabian Ministry of Education has worked hard to raise the standards for, and efficiency of, both public and private universities. Through oversight and collaboration with universities, the Ministry of Education advances scientific research, investing plenty of attention towards development within the scientific research field (Ministry of Education, 2019).

Faculty members at Saudi Arabian universities are classified by the Ministry of Education as professors, associate professors, and assistant professors, as well as others such as teaching assistants and lecturers (Al Yahya & Irfan, 2012). In order to have permanent positions, teaching assistants and lecturers who obtain promotions must obtain a doctoral degree. Promotions toward higher academic positions must meet multiple conditions such as years of service, number of publications, teaching experience, and service provided to the university and society (Al Yahya & Irfan, 2012).

At Saudi Arabia's state universities, there are two distinct categories of academic faculty positions. According to Al-Ohali and Al-Mehrej (2012), the first type of position is for a Saudi citizen faculty member, providing high levels of job stability, a regular, set annual income with monthly bonuses, and opportunities to attend conferences and training courses. The second, non-permanent position type is available for faculty members who are Saudi citizens and other

faculty members who work on renewable contracts. These faculty members have negotiable salaries, and may obtain additional benefits depending on their major and specialization.

Definition of Online Teaching Tools

Online teaching is a modern method of education that often involves the presence of the student in a place far from the knowledge source. Online teaching is instruction that takes place over the Internet, and the methods used for instructional delivery (sometimes asynchronously). There are many universities and colleges around the world that offer online instruction, and it has become an important way to successfully pursue educational goals across geographic distances and through various methods (Alaugab, 2007). Defining distance education is important to understand online teaching. Moore (1993) has defined distance learning as, “the universe of teacher-learner relationships that exist when learners and instructors are separated by space and/or by the time” (p. 22).

There are many experts within education that have defined distance learning, providing a meaningful context for the teaching and learning process where learners and educators are separated by time and place. In these instances, they make use of technology tools or platforms as delivery modes to achieve instructional goals (Boettcher & Conrad, 1999). As Alaugab (2007) has explained, the separation when using technology tools means that learners and educators are in different places geographically, sometimes meeting from different countries. Time differences arising from online instruction impact whether there is interactive communication between learners and educators at the same time (synchronous), such as with video and audio communication, or asynchronous communication that allows the learner to participate in the class without being online at the same time as the educator (such as online discussion forums).

The use of technology tools through access to the Internet is another definition of online education. These technology tools allow instructors to disseminate a wide range of information and curricula that promote the learning and teaching process (Rosenberg, 2001). This definition emphasizes the strength of using technologies to deliver instructional methods and content. Instructional content is delivered through the use of the Internet (World Wide Web) services via computers or technological tools, which can be highly useful to learners (Allehaibi, 2001; Khan, 1997).

The Beginning Use of Internet and Computers in Saudi Arabia

Distance learning has expanded access to education, and has undergone change over time (Harris & Krousgrill, 2008). The overall need for the Internet at higher education institutions has grown, impacting the future of education (Shaw & Polovina, 1999). It has become an important learning tool. The Internet has changed communication between faculty and students, which helps them to contact each other at any time and from any place (Bates & Sangrà, 2011, p. 31). Today, many colleges view technology as a way of increasing collaboration in learning among students. The increase in the use of technology at learning institutions stems from the fact that the current generation exists in the digital world. Moreover, there is a belief that they are the fastest adopters of technological advancement (BrckaLorenz et al., 2013). Technology has been critical in facilitating collaboration within campus communities. It assists in the acquisition of information and connection with peers, which provides an environment that supports faculty and students throughout the learning process (Resta & Laferrière, 2007). A recent study found that 96% of those who interact with technology and the Internet are between 18 and 29 years old, and 97% of frequent Internet users have at least one college degree (Pew Research Center, 2015).

In 1993, King Fahd University of Petroleum and Minerals (KFUPM) in Dhahran became Saudi Arabia's first educational institution to connect to the Internet (Khalid, 2001). Internet usage by the general population became legal in the country in 1997, and the government and colleges both had access to the Internet by 1999 (Alqarni, 2015). Since universities in Saudi Arabia were the first governmental agency adopters of technology and Internet access, it sparked a unique shift across campuses (Alshawi & Alwabil, 2013). However, the Communications and Information Technology Commission (CITC, 2007) reported that, “despite increased Internet connectivity in Saudi Arabian higher education institutions, there is little empirical research investigating the factors associated with the use of the Internet by faculty in teaching, research, and communication.” Allehaibi (2001) assessed Saudi Arabian universities' acceptance and use of Internet technologies by faculty members, and found that 25% of faculty members were reluctant to use the Internet in instruction, whereas 74% of faculty were using Internet and technology tools. This study was conducted when the Internet was not officially used at universities in Saudi Arabia. In a newer study, Alshawi and Alwabil (2013) examined Internet usage by faculty in Saudi Arabia, finding that faculty members communicate online more often than they conduct research, or for teaching purposes. At the same time, 71% of faculty think that the Internet plays a progressive and substantial role in their work. On the other hand, roughly one half (50.5%) of faculty use the computer more than three hours per day.

The computer has become an important tool in higher education and in Saudi Arabia as a nation. It is a powerful tool that has the ability to enhance student learning and, at the same time, provide faculty with resources that encourage teaching (Almuqayteeb, 2009). In another study about faculty using computers in higher education, Alsharidah (2018) found that 90% of faculty believed that it was important to utilize computer information technology in the classroom.

However, a small minority (18%) of faculty did not agree with the use of computer information technology.

Today's society continues to profit from the usage of computer programs and online tools for educational purposes. Computer technology at higher education institutions enhances pedagogical practices that directly influence teaching and learning (Oblinger & Rush, 1997). When used correctly, technology can change the roles of educators and students. When college students use computer technology to improve their communication skills, they assume an active role as opposed to a passive one (Al-Hariri & Al-Hattami, 2017). In classrooms, when the inclusion of computer technology is thoughtful and seamless, students are more engaged due to the perception that they are taking charge of their own learning. Effective incorporation changes the nature of classrooms and, in the end, encourages project and student-centered learning. However, the level of change relies on the type and amount of technology, such as mobile devices, laptops, e-readers, and interactive whiteboards (Al-Hariri & Al-Hattami, 2017).

Institutions in Saudi Arabia's Adoption of Distance Learning in Higher Education

In order to incorporate technology tools and distance learning into public Saudi universities, the Ministry of Education was eager to establish deanships for e-learning and distance education. Alqarni (2015) briefs the history of using online teaching at some of the universities in Saudi Arabia. In 2003, e-learning centers were established in Aum Alqura University and King Fahad University of Petroleum and Minerals. The purpose of the centers was to assist faculty and staff with the use of technology, thereby improving the process of education. The Deanship of E-Learning and Distance Education was also established by King Abdulaziz University in 2004. By creating a Deanship of E-Learning and Distance Education in 2007, King Saud University adopted a similar strategy. Since then, a number of other universities

in Saudi Arabia, including Aljouf University and Taibah University, have also set up Deanships of E-learning and Distance Education with the intention of aiding the transition to online education (Bajabaa, 2017; Alanazy, 2017). Aljaber (2018) explains that creating a suitable e-environment to share resources, content, and training, and that enables faculty and colleges to conduct online instruction is the primary responsibility of the Deanship of E-Learning and Distance Education at Saudi Arabian universities. This department is also responsible for training faculty and staff in the use of electronic and technology-based learning products. It has the responsibility to integrate training models, organize online courses, design instruction, improve online content, and control smart and information technologies at the university (Aljaber, 2018). This Deanship is also keen to educate and follow-up with faculty members who integrate technology, as well as enhancing Internet access for students (Alkhalaf et al., 2013).

As mentioned previously, the government of the Kingdom of Saudi Arabia and the Ministry of Education have made great efforts to develop distance education, which has led to the establishment of the National Centre for E-learning and Distance Learning. As Yamani (2014) explained, the goal of the National Centre for E-learning and Distance Learning is to create an integrated system for utilizing e-learning and technologies in support of higher education in Saudi Arabia. Many outstanding projects have been adopted by this center. Among them is the Saudi Digital Library Project (SDL), which was established in 2010. Alasem (2013) identified the purpose for establishing SDL, explaining that it provides more than 240,000 full electronic books in diverse disciplines, eases the research process for Saudi students and faculty members around the world, and provides access to multiple search engines. According to earlier research, e-learning is actively being pursued by many Saudi Arabian higher education institutions. These include multiple institutions such as King Faisal University, King Khalid

University, Taibah University, King Abdulaziz University, Madinah Islamic University, Qassim University, and King Saud University (Alkhalaf et al., 2012; Aljaber, 2018).

Faculty Attitudes Towards Technologies and Online Teaching in Saudi Arabia

This section reviews the literature related to faculty attitudes towards online teaching in Saudi Arabia. Tabata and Johnsrud (2008) emphasized that the growth of online teaching in higher education depends on faculty members to use technology for the success of instruction and learning. These findings also affirm that faculty are pivotal in the success of online teaching and the academic quality of online instruction. A previous study by Alshehri (2005) examined faculty attitudes toward factors involved in simplifying the adoption of online teaching in some practices at the Institute of Public Administration at Riyadh. The findings from this research indicated that there were positive attitudes toward the adoption of online courses at this institution, and found that some different demographic variables had influenced participants' responses (such as number of years with technology experience, gender, number of years teaching, academic rank, age, qualifications, and place of work). Additionally, Alaugab (2007) explored both female faculty and student attitudes toward the adoption of online teaching at Mohammed bin Saud Islamic University. The study's findings showed that instructors and students both had favorable opinions towards adopting online instruction, but that there was a lack of English Language skills. This presented the highest barrier among faculty and students since most of the technology tools, research platforms, and devices were dependent on English as a primary language. Likewise, Alsaif (2005) conducted a study to define the motivations and inhibiting causes affecting the use of Web-based learning at Qassim University. The findings from the study showed that faculty members generally had favorable opinions regarding the adoption of WBI and that several factors including administrative support, concerns about the

quality of the courses, and technical support, had an impact. The report recommended that the institution support and improve faculty use of WBI.

Several studies have been carried out to examine the extent of online teaching integration as well as the barriers that hinder effective integration. In spite of the numerous efforts put toward this concept, integration of technology and innovation at learning institutions in various countries around the world is still very slow, and Saudi Arabia is not an exception (Alharbi & Lally, 2017). There are several factors that contribute to this slow integration in Saudi Arabia, which include faculty attitudes and intentions towards the use of technology, resistance to change, and perceived sociocultural influences (Alfarani, 2015). Additionally, other internal factors influencing faculty decisions to incorporate technology in teaching include feelings of anxiety, individual beliefs, and feelings of incompetence (Alfahad, 2012). Further, since Saudi Arabia is a developing country, the adoption of technology has not been well accepted. The infrastructure remains underdeveloped, which has had significant effects on faculty attitudes towards its effectiveness (Tashkandi & Al-Jabri, 2015). Since many faculty have strong negative attitudes towards the integration of technology in higher education, understanding their attitudes and the factors behind these attitudes is necessary (Unser, 2017; Koç, 2014).

According to Al-Zahrani (2015), the pre-service teacher education program in Saudi Arabia continues to be built on the conventional conception of instruction, and online instruction is still a rare way for technology to be incorporated into the curriculum. However, other studies have indicated that new teaching methodologies have been established and deployed alongside teacher training programs as a way to introduce and utilize educational technology (Alqarni, 2015). Faculty use of technology helps in enhancing educational quality through encouraging positive learning, and introducing concepts in different ways via gaming, online classroom

activities, multimedia presentations, and creating blogs or wiki (Lebenicnik et al., 2015; Lee & Markey, 2014). However, the complete use of educational technology in Saudi Arabia comes with a variety of challenges including a lack of proper policies, a constant increase of Internet users, and Saudi views regarding the technology (Alqarni, 2015). Saudi faculty member attitudes represent one of the most impactful factors in the integration of technology and innovation at higher learning institutions. Promisingly, studies have shown that faculty do believe that technology has effectively led students to meaningful learning (Bajabaa, 2017).

Using technology at Saudi Arabian universities has contributed to increasing the international ranking. In 2003, no Saudi Arabian universities appeared in the world academic ranking. However, in 2016 there were four Saudi universities appearing among the top 500 universities globally (Abouelnaga et al., 2019). Currently, the most active integration of e-learning within higher education is in Saudi Arabia, with services offered depending on the courses and faculty (Aljaber, 2018). The majority of universities in Saudi Arabia now use e-learning. Staff, faculty members, and students are all able to benefit from these interactive learning opportunities (Aljaber, 2018).

Universities of the Eastern Region Associated with the Study

Imam Abdulrahman bin Faisal University (IAU)

The Imam Abdulrahman bin Faisal University is abbreviated as IAU, and is a public institution established in 1975. This university is located in the large city of Dammam in the Eastern Province. IAU has grown to become an extensive research university in Saudi Arabia that includes 21 campuses throughout the Eastern Province with 38,249 students, 3,179 faculty, and 4,559 staff (Imam Abdulrahman bin Faisal University, n.d.). The Imam Abdulrahman bin Faisal University split from King Faisal University in 2009 (Aljaber, 2018).

King Faisal University (KFU)

The abbreviation for King Faisal University is KFU, and it is a public institution established in 1975. It is an ancient university in the Kingdom of Saudi Arabia located in the Eastern Province (King Faisal University, n.d). The website for King Faisal University shows current information about the number of colleges, students, administrators and faculty members. Specifically, KFU, “includes 16 colleges, 10 Supportive Deanships, 21 Scientific Research Centers and Supportive Entities and 27 Administrative and Service Entities” (King Faisal University, n.d). The total number of students reached 40,229 (36% males and 64% females). In addition, 126,296 students are registered in distance and e-learning asynchronously. KFU reports having 1,924 faculty (60% males and 40% females). King Faisal University has a broad plan to implement distance learning, and offers faculty and students multiple ways to use e-learning such as Blackboard, Web CT, a Learning Management System, synchronous virtual classroom systems, class capturing/recording systems, authoring tools and content management systems, and an online exam system (King Faisal University, n.d.).

University of Bisha (UB)

The abbreviation for University of Bisha is UB. The University of Bisha is a public institution established in 2014 through the decree of King Abdullah bin Abdulaziz (University of Bisha, n.d.). It is located in the southern part of Saudi Arabia in the city of Bisha. The University of Bisha was part of King Khalid University. When the royal decree came, it was separated and became an independent university (University of Bisha, n.d.). The University of Bisha includes approximately 15 different colleges geographically located between Bisha, Tathleeth, and Al-Namas. The number of students is around 17,000 (including both males and females), and the number of faculty members is around 1,200 (University of Bisha, n.d.).

Even with the provision of all the ingredients for e-learning at Saudi universities, Aljabre (2012) emphasized that the use of distance education depends ultimately on the decision of faculty members to employ distance learning and to be leaders in the field. Thus, in the next section, the focus will shift to the demographic variables related to adopting online teaching by faculty members.

Demographic Variables Related to Adopting Online Teaching by Faculty Members

Gender

Online teaching is designed to deliver instruction through the use of technology tools to the benefit of faculty or students, male or female. Previous studies have emphasized that gender is one of the factors that may have an influence on faculty member attitudes towards the adoption of online teaching. For example, one study indicated that female faculty members are more confident compared to male faculty members (El-Rashidi, 2007). Likewise, previous research has shown that in Saudi Arabia, female faculty were more willing to adopt e-learning than male faculty (Al-Ghaith et al., 2010). Additionally, Trego (2003) conducted a study to assess gender variation in the three contexts of communication patterns, preferred styles, and communication in asynchronous computer and multimedia-based distance learning. The findings from this study indicated that the most important factor affecting communication patterns and learning styles in online teaching was gender, and it was found that female students were more likely to interact in the classroom than male students.

Another study conducted by Kim et al. (2011) found that there was no effect of gender on factors influencing distance learning and social presence in higher education. Therefore, the literature review shows that gender may play a moderating role in the use of distance education, whether in relation to students or faculty members (Haley, 2013; Hyun 2004).

Age and Teaching Experience

Another variable that can affect the use of distance education among faculty members is age and teaching experience. Abbasi et al. (2015) confirmed that these key demographic variables play significant roles in the acceptance of technology on an individual level. Alsaif (2005) found that younger faculty members were more effective when using computers and the Internet than older faculty members. On the other hand, a study conducted by Adams (2002) found that younger faculty express more concerns with adopting technologies to their teaching practice than older faculty. According to Petherbridge (2007), age was found to be an indication of faculty concerns related to utilizing learning management systems in teaching practice. Older faculty members revealed that they were less interested in adopting and using learning management systems. Previous studies have emphasized that in Saudi Arabia, teaching experience does not appear to influence faculty members to adopt technology in the learning process (Al-Sarrani, 2010; Kamal, 2013). Adams (2002) investigated the extent to which faculty teaching experience could be associated with technology use. He found that faculty with zero to 3 years of experience had high levels of technology adoption, while faculty with 10 to 19 years of teaching experience had lower levels of technology adoption. Computer experience is described as a combination of a teacher's exposure to computers, as well as the skills and abilities acquired in using computers to perform various tasks (John, 2015). The level of faculty acceptance and attitudes toward technology integration is highly dependent on their previous experiences, including the skills they have gained and the manner in which they were taught (Loague et al., 2018).

Academic Rank, Nationality, Type of Contract, and Disciplines

Prior research (Alharbi, 2002; Al-Saif, 2005; Alnujaidi, 2008) has investigated the relationship between technology adoption and using technology in the learning process. Findings indicate that academic rank plays a role among faculty members in Saudi Arabia. Additionally, Alhawiti (2011) conducted a study to evaluate the attitudes of faculty from various academic ranks in Saudi Arabia in relation to the adoption of distance learning. It was found that assistant/associate/full professors were more likely to be persuaded to adopt distance learning than instructors and lecturers. As mentioned earlier, there are different types of contracts for faculty members at Saudi universities, and for those of different nationalities who are not from Saudi Arabia. Petherbridge (2007) emphasized that faculty members who have the lowest job security are more likely to use technology and adopt distance learning in the teaching process. Faculty who get financial bonuses and job security, who are faculty recruited, or those who are hired with a teaching focus are not concerned about the reward structure for using technology and adopting online teaching.

Petherbridge (2007) found that the various academic disciplines had different concerns about using distance learning in the teaching process. Specifically, faculty who were working in the education department had a different workload compared to other faculty from different colleges. Lee (2000) confirmed that it was necessary to take into account the differences in the disciplines as one of the influencing factors when adopting distance learning and technology in the teaching process. The difference in specializations means that there is variety in the workload. The previous work of Biglan (1973) categorized the most common activities that faculty participated in, such as socializing and publishing papers based on their academic disciplines. There exists a considerable body of literature about the differences in technology use and adoption of online teaching by faculty members based on their departments or disciplines.

For example, some disciplines require digital access for programs, such as in the sciences. Other departments require distance workplaces and digital resources such as in the Humanities (Jones et al., 2004; Al-Sarrani, 2010).

Faculty Advantages Associated with Adoption of Online Teaching Tools

The adoption of online teaching in higher education institutions has become increasingly popular as a way to improve the quality of education. Currently, online teaching systems have become an effective way to achieve the vision of training a wide audience from a wide variety of lifestyles (Alaugab, 2007). Online teaching offers many benefits for faculty and learners. It allows the instructor to create and deliver course content, and to help the instructor to observe and assess learner performance (Almarashdeh et al., 2011).

Flexibility of Access

Previous studies have shown that online teaching systems are useful as a way to provide flexibility and access to learning resources for instructors and learners (Bostrom, 2003). Khan (2004) explained that one of the advantages of online teaching is that it offers opportunities to focus on the learner, encourage them, interact, and provide easy accessibility within an effective and meaningful learning environment. Alexander et al. (2009) conducted a study about the online teaching experiences of faculty. Findings from the study indicated that the majority of faculty expressed satisfaction with using distance learning courses and had the motivation to implement online courses based on accessibility and flexibility of use. In a different study, Chawdhry et al. (2012) examined faculty perceptions towards e-learning systems, finding that faculty members appreciated the significance of online teaching and the flexibility it provided for accessing learning content.

Collaboration and Communication

Internet access at universities is not only crucial for online teaching, but also increases the quantity and quality of instruction. This creates new possibilities for communication and collaboration among faculty and students (Peter & Patricia, 2001). Paul and Cochran (2013) emphasized that the foundation for the success of online teaching for the institution, faculty, students, and staff depends on emphasizing and prioritizing high quality. All members within the institution must contribute to this success through their various roles and responsibilities. The use of technology can help to achieve improvements in communication at educational institutions among administration, faculty, students, and staff, which can lead to successful completion of tasks. Likewise, online teaching systems enhance collaboration and communication in the learning process, allowing students and faculty to keep in touch beyond instructional time (Altameem, 2011).

Assessment

Assessing a student involves taking a sample of a student's performance in a lesson, activity, or project and evaluating their abilities (Bull, 1999). The adoption of online teaching can help learners and faculty to assess their work in a consequential way that reminds students to be conscious of their performance and to accept feedback (Riasati et al., 2012). Assessment and evaluation may be beneficial when conducted through online teaching, as the virtual environment contributes to different metacognitive strategies such as self-monitoring, personal management, focus, and planning objectives (Gautreau, 2011). Online feedback and evaluation during the learning and teaching process can develop students' performance. However, students must also monitor their own performance to ensure that they achieve learning goals (Maclellan 2001; O'Donovan & Price, 2008). Fulda (2005) emphasizes that using online tools in assessment not only saves effort, but also increases efficiency and helps faculty to avoid mistakes while

reporting grades. Furthermore, students can receive their grades at any time and from any place. As a result, faculty who use online feedback in higher education can vary their methods of assessment through the use of text, audio, and video. Students must concentrate more on their own original documents (Hepplestone et al., 2011).

Faculty Challenges Associated with Adoption of Online Teaching Tools in Higher Education

This section reviews the literature related to challenges that faculty face related to the use of technology in the learning process in higher education. Ultimately, there are different variables that influence faculty attitudes towards the adoption of online learning, such as self-efficacy, anxiety, and training.

Self-efficacy

Self-efficacy has been mentioned in multiple studies as one of the major factors that determines faculty attitudes towards the adoption and integration of online teaching tools. The concept of self-efficacy can be defined as a measure of an individual's ability to complete a certain task and reach their intended goals using the available resources (Motshegwe & Batane, 2015). The self-efficacy theory popularized by Bandura (1994) advocates for an individual's belief in their capability to perform a certain task. Self-efficacy helps people generate innovative courses of action by focusing on their knowledge and symbols of power. Self-efficacy beliefs are considered to be a critical determinant of a teacher's use of technology and online teaching in their teaching practice (Abbitt & Klett, 2007).

Research studies have established that self-efficacy is essential in determining the effectiveness of adopting online teaching in educational institutions. In essence, self-efficacy plays a crucial role in teachers' adoption of technology, with studies indicating that teachers who

have greater self-efficacy are more likely to use different teaching techniques and adopt a student-centered teaching approach (Birisci & Kul, 2019). On the contrary, teachers with low self-efficacy perceptions are more likely to concentrate on educator-centered instructional methods during in-class teaching (Birisci & Kul, 2019). The overall argument indicates that there is a strong relationship between knowledge, self-efficacy, and attitudes towards the use of technology in teaching and among faculty members (Kazan & El-Daou, 2016). Giles and Kent (2016) posited that self-efficacy combined with knowledge is a necessary requirement for an instructor's effective adoption and integration of instructional technology and innovations.

Faculty Anxiety

Anxiety can be defined as a fear of the unknown, where people fear that with which they have no experience. When it comes to using online teaching in higher learning, the condition of anxiety describes faculty members' fears about the implications of computer usage, which can include loss of data or even making serious mistakes when delivering instruction (John, 2015). Studies have indicated that anxiety and implicit learning abilities have a significant impact on teacher and administrator attitudes towards promoting the use of information technology at their classrooms and institutions (Jon-Chao et al., 2012). Computer anxiety is common and determines the extent to which faculty members are willing to use technology in their classrooms depending on their knowledge and experience (Celik & Yesilyurt, 2013). This form of anxiety affects faculty attitudes, as it makes the teaching staff perceive online teaching as a threat to the effective delivery of information. Hence, they tend to reject online teaching or to adopt it at very low levels (Abrahams, 2010).

Faculty Training

Institutions of higher learning should establish training and development procedures in order to foster digital literacy among faculty members. Such protocols would help institutions mediate the complexity of using distance learning as well as increase positive attitudes (Tabata & Johnsrud, 2008). Since a majority of current higher education faculty members have acquired their teaching skills and abilities without the integration of educational technology, they often lack experience with using technology in the classroom (Mishra et al., 2007). Ali (2003) emphasizes that in order to integrate technology without any anxiety, administrations should support their faculty by providing instruction towards utilizing technology rather than by providing equipment alone.

On the other hand, Ali (2003) also reports that technology support should be given to faculty with a free choice of whether to use technology tools in their instruction or classes. Berson et al. (2000) clarify that most faculty develop their teaching techniques through acquired skills from faculty training courses, so faculty should receive appropriate training that qualifies them to use different technology methods for the classroom. Consequently, the online teaching acceptance model proposes that faculty self-efficacy, experience, and anxiety are some of the major challenges that should be examined when determining the appropriate types of technology innovations that should be adopted and integrated into institutions of higher learning (John, 2015).

The Decomposed Theory of Planned Behavior

Recently, there are different models and approaches that have been developed to identify reasons for the adoption of new technology tools. One of these models and approaches is the Decomposed Theory of Planned Behavior (DTPB), developed by Taylor and Todd in 1995. In order to better identify the complex factors and challenges that influence faculty decisions to

adopt online teaching within Saudi Arabian higher education, The Decomposed Theory of Planned Behavior was chosen as a theoretical framework for this study. This theory helps to conceptualize how individuals adopting technology can increase the efficient utilization of technology at institutions (Tyler & Todd, 1995). The DTPB was based on The Planned Behavior (TPB) model that was previously developed by Ajzen in 1991, and which was designed to explore the social and institutional control factors influencing technology usage. According to Herrero et al., (2008), the purpose of the DTPB model is to explain the behavior of an individual based on the relationships among beliefs, attitudes, intentions, and behavior. According to this model, there are three components that may impact and help to explain an individual's actions: attitudes, subjective norms, and perceived behavioral control. Intention is considered the best indicator of behavior.

The DTPB model was selected as a framework for this study, exploring the factors affecting the adoption of online teaching by Saudi faculty. These factors are attitudes, subjective norms, and perceived behavior control (Figure 1). In the next section, a description of each factor that influences a human being's behavioral intention is presented.

Attitude

According to Taylor and Todd (1995), an attitude refers to how people favor behaviors. Attitude includes the three components of perceived usefulness, perceived ease of use, and compatibility. Perceived usefulness refers to the range to which an individual believes that the use of technology enhances performance. For example, it directs the extent to which faculty members at the three universities (IAU, KF, UB) in Saudi Arabia may think that adopting online teaching promotes their teaching practice. The perceived ease of use is the extent to which the level of technology is easy to use, know, and understand. For example, it would refer to the degree that faculty members at Saudi universities feel that adopting online teaching requires limited potential. This means that the less difficult and complex the use of technology, the greater the likelihood of acceptance for adoption. The last component of attitude is compatibility, which refers to the level at which technology is appropriate with the individual's existing behaviors. For example, compatibility is the extent to which adoption of online teaching is possible and suitable to the roles of faculty members at Saudi universities.

Subjective Norms

According to Taylor and Todd (1995), the concept of subjective norms refers to the idea that various individuals and social groups may influence a human being's behavior related to the utilization and adoption of technology tools. In this study, the social pressure upon faculty members who are working at Saudi universities to adopt online teaching is made up of three social groups: students, peers (other faculty), and superiors.

Perceived Behavioral Control

According to Taylor and Todd (1995), perceived behavioral control refers to the extent to which individuals feel that they have control of their behaviors. The two factors affecting

perceived behavioral controls are facilitating conditions and self-efficacy. For example, in this study, self-efficacy refers to the trust that faculty members have in their abilities to adopt online teaching into their teaching practice. Higher degrees of self-efficacy indicate confidence in the ability of faculty to adopt technology or online teaching for their learners. Facilitating conditions indicate the accessibility of resources used to assist in using and integrating the technology. For example, in this study, facilitating conditions are online tools and learning management systems provided by Saudi eastern region institutions. However, simply providing these resources does not mean that there will be an increase in online teaching adoption among faculty (Taylor & Todd, 1995).

Summary

This literature review has provided an overview of the perceptions of faculty members at Saudi Arabian universities towards adopting online teaching in higher education. The initial source of the push towards adoption of online teaching was the Ministry of Education (MOE) in Saudi Arabia. Some of the current challenges faced by the MOE include a lack of encouragement, lack of an environment for creativity and innovation, a dependence on traditional teaching methods, and a lack of evaluation skills for faculty (Ministry of Education, 2016). In addition, the MOE has found it necessary to improve the learning environment in the classroom to stimulate creativity and innovation. This involves increasing the efficiency of performance through the use of new technologies in the educational process and teaching system (Ministry of Education, 2016). In response to these challenges, the MOE has established the National Transformation Program to develop a plan to improve the higher education system. The program aims to complete its goals and vision by 2030.

To summarize, online teaching was discussed and defined in order to establish the theoretical framework. The beginning of the literature review chapter provided an overview of higher education in Saudi Arabia, and the origins for the use of distance learning in higher education in Saudi Arabia. Characteristics of the universities from the eastern region associated with the study were also discussed. Following this was a discussion of the demographic variables related to adopting distance learning by faculty members, advantages associated with the adoption of online teaching, and challenges associated with the adoption of online teaching in higher education. Finally, this chapter discussed and reviewed The Decomposed Theory of Planned Behavior, explaining how it related to the study.

The following chapter discusses the methodology used in this study to determine factors and challenges that influence faculty decisions to adopt online teaching, as well as exploring the complex roles that exist for faculty members adopting online tools into their teaching practice within Saudi Arabian higher education.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This descriptive study investigates the factors and challenges influencing faculty member adoption of online teaching into teaching practice at Saudi universities. This study aims to:

- 1- Identify whether the differences that exist in Saudi faculty members' use of online tools can be associated with factors such as gender, age, academic rank, teaching experience, department or college, nationality, type of contract, possession of personal online and digital tools at home, provision of a university office with online and digital tools, connection to the Internet at a university, and connection to the Internet at home.
- 2- Determine the perceived advantages and disadvantages for faculty members using online teaching in the instructional process.
- 3- Determine perceived challenges for faculty members using online teaching in the instructional process.

The research methodology chapter discusses the procedural methods that were implemented in order to answer the research questions. This chapter is presented in the following sections: research design, research setting, research procedures, the instrument, description of the study, reliability and validity, data collection, and data analysis.

Research Design

The design for this study used mixed methods, involving a combination of quantitative and qualitative data forms (Creswell & Creswell, 2017). Johnson, Onwuegbuzie, and Turner (2007) have described mixed methods as a process in which data are collected from both qualitative (open-ended) and quantitative (closed-ended) approaches. Both data types are then

analyzed in order to answer research questions. Additionally, the researchers have also explained that mixed methods designs allow for multiple approaches to data analysis through merging, connecting, or embedding the data. Mixed methods studies are also flexible when it comes to the timing of data collection (such as concurrent or sequential), as well as the emphasis (equal or unequal) for each data set. The procedures associated with mixed methods studies can be informed by theory (Johnson et al., 2007). The purpose of using mixed methods for this study was to identify the factors influencing the adoption of online teaching by faculty members at Saudi universities. This mixed methods approach allows for a combination of quantitative and qualitative data analysis to answer the research questions.

Mixed Methods Design

Creswell and Creswell (2017) have discussed how mixed methods studies provide both qualitative and quantitative data in various forms. For example, qualitative details from participants can be compared with quantitative statistical data, leading to and supporting the same results. In the 1980s, mixed methods first began to emerge as a distinct research design method (Tashakkori & Teddlie 1998; Creswell et al., 2011). Additionally, researchers felt that the most appropriate approach to understanding the psychological state of individuals in studies was through mixed data collection (Campbell & Fiske, 1959). This idea has driven the decision to choose a convergent parallel mixed methods design in order to gain multiple forms of information about faculty members and online teaching.

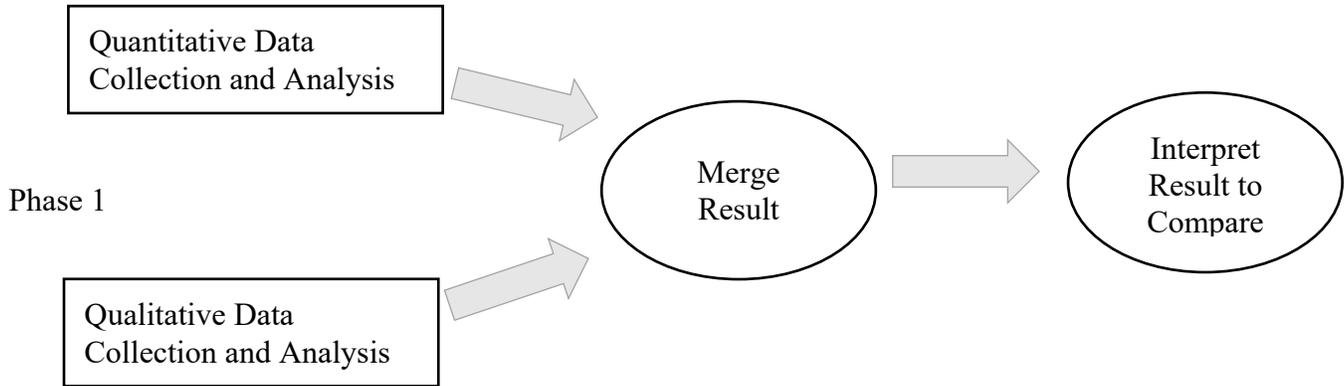
There are different types of mixed methods designs including Convergent Parallel design, Embedded Design, Explanatory Design, and Exploratory Design. Each method differs in its approach to collecting and analyzing data, and depends on the field of study. These designs have been defined by Creswell and Clark (2017). The Triangulation, or convergent parallel design as

Creswell and Clark (2017) describe it, is the most widely known and familiar mixed methods approach. The intention of this approach is to analyze multiple forms of data in order to achieve complementary results. This provides deeper understanding of the research problem. The Embedded Design is a mixed methods approach that provides support for a primary data set. This design is often used in the case of an experimental or correlational design study. For example, in an experimental study, the investigator may collect an additional data set in order to further develop a treatment or follow up on the results of an experiment. The Explanatory Design is a two-phase approach in which qualitative data is collected and used to expand upon initial quantitative results. Last but not least, the Exploratory Design is a two-phase approach in which the results of the first method (quantitative) can help to inform the second method (qualitative). This is useful when the variables of the study are unknown, or the instruments are not readily available. It is useful for designs that begin with qualitative data collection, and can be helpful to explore a phenomenon.

A convergent parallel mixed methods design was chosen for this study, and is the most famed and advanced of the mixed methods strategies. The data collection was conducted in a single-phase approach, with both quantitative and qualitative data collected together, but analyzed separately (Creswell & Creswell, 2017). A comparison of the results was then conducted in order to confirm or disconfirm the results from the data sets (Creswell & Creswell, 2017). Figures, flowcharts, and diagrams related to the mixed methods presented in this chapter have been included with permission from John Creswell (See Appendix L).

Figure 1

Convergent Parallel Mixed Methods



Note. Convergent Parallel Mixed Methods. Adapted from Research Design (5th ed., P. 218), by Creswell and Creswell, 2018, Sage. Adapted with permission.

Research Setting

This study was conducted at Saudi Arabian universities in the different regions of the country. These universities included King Faisal University (KFU), Imam Abdulrahman bin Faisal University (IAU), and University of Bisha (UB). An overview of these universities was provided in the second chapter (Literature Review), and included information such as a description of the establishment, the number of colleges, and the number of faculty members and students.

Figure 1 demonstrates that data collection for convergent parallel mixed methods occurs in one phase. The survey was designed to collect both quantitative and qualitative data based on the research questions. Survey data from faculty members were collected and analyzed within a similar timeframe.

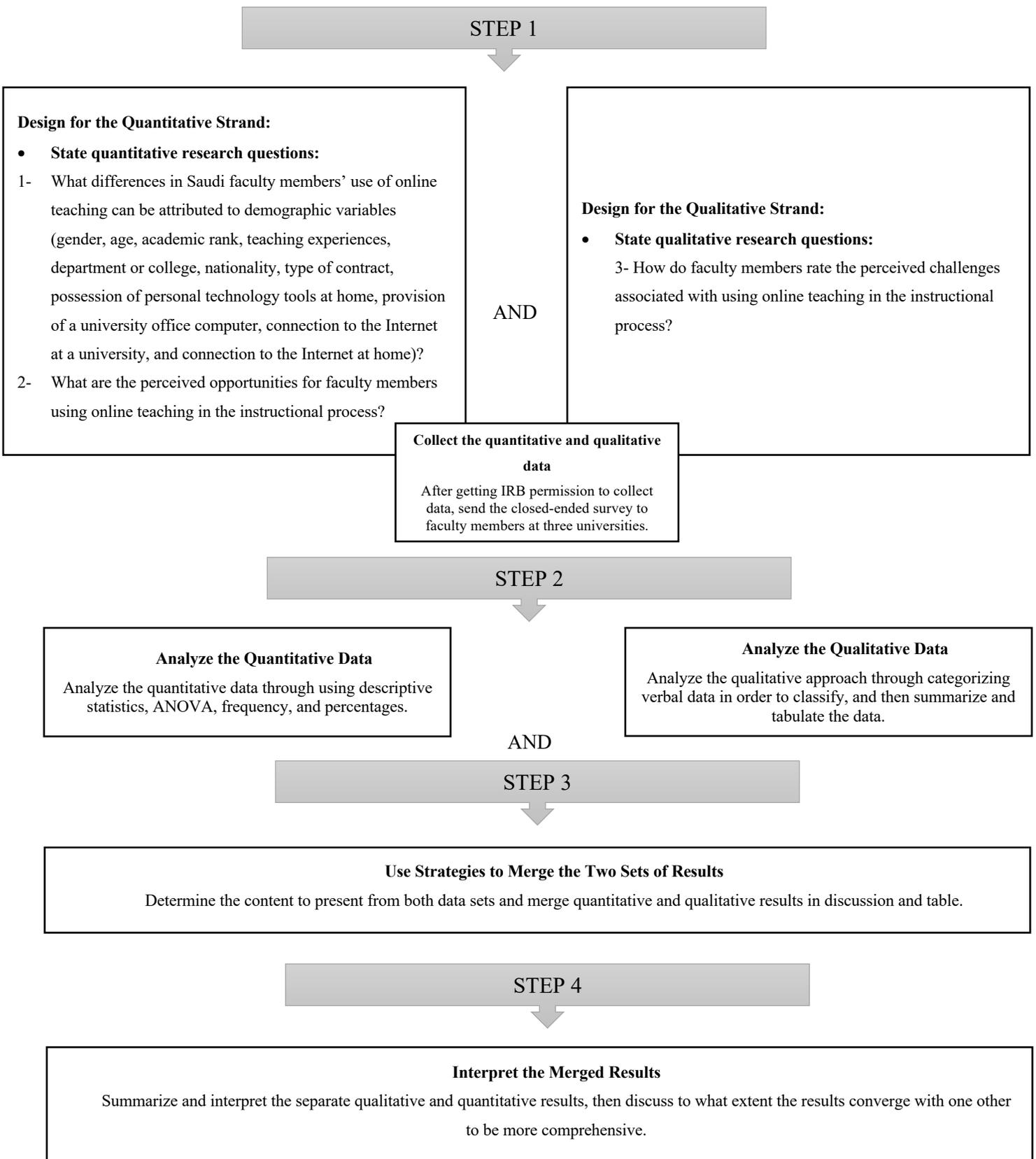
Research Procedures

During the first phase of this convergent parallel mixed methods study, a survey inclusive of quantitative (closed-ended questions) and qualitative (open-ended questions) questions was

distributed to faculty members who were currently working at King Faisal University (KFU), Imam Abdulrahman bin Faisal University (IAU), and University of Bisha (UB). This survey was designed to gather information about faculty experiences with the adoption of online teaching into their teaching practice. Study procedures were designed in alignment with the specified procedures of Creswell and Clark (2017). Figure 2 shows procedures and steps for this study according to Creswell and Clark's convergent mixed methods design.

Figure 2

Flowchart of Implement the Convergent Parallel Mixed Methods Procedure and Steps for this Study



Note. The Convergent Parallel Mixed Methods Procedure and Steps for this Study. Adapted from Designing and Conducting Mixed Methods Research (3rd ed., P. 70), by Creswell and Clark, 2017, Sage. Adapted with permission.

The Instrument

McMillan (2012) has defined a questionnaire as a written document used to gain information about topics such as, “attitude, beliefs, values, perspectives, and other traits” (p. 154). Questionnaires can be helpful for gathering original data about the participants such as experiences, attitudes, opinions, and awareness about events (McLafferty, 2003). The answers to the questionnaire usually include factual information from participants, expressing their opinions or experiences (Acharya, 2010). Within a mixed methods approach, questionnaires can be powerful for several reasons. McGuirk and O'Neill (2010) have discussed how questionnaires are effective for collecting both qualitative and quantitative data, which is important for complex research involving factors such as different geography, social identity, travel, or transportation. Although the questionnaire has limitations in qualitative research, it has many strengths. First it, “can provide insights into social trends, processes, values, attitudes, and interpretations” and, “it is one of the more practical research tools in that they can be cost-effective, enabling extensive research over a large or geographically dispersed population” (McGuirk & O'Neill, 2010, p. 266). There were several reasons for choosing the questionnaire as a data collection tool for this study. One of the biggest reasons was that the study took place at a different geographical location in relation to the residence of the researcher. Also, this study was conducted on three geographically distinct campuses: Imam bin Faisal University in Dammam city, King Faisal University in Al Asha city, and University of Bisha in Bisha city. Online questionnaires also allow the researcher to easily transfer data from the platform to data analysis programs such as QuestionPro. This in turn allows the user to transfer data to SPSS. Online questionnaires also allow the researcher to keep data more confidential, such as by linking the QuestionPro platform to a university researcher's specific account. This ensures that no unknown people will be able to

access the data platform without permission. Questionnaires are also easy tools that can be prepared in several ways, whether online or in a physical location.

The questionnaire developed for this study was distributed to a large number of participants from Imam Abdulrahman bin Faisal University, King Faisal University, and University of Bisha. It was delivered via email to both male and female campuses. The survey was designed using QuestionPro, which is an online survey tool and service made available to Virginia Tech students. Finally, the consent form and survey form were provided in both Arabic and English languages in order to ensure that participants understood each part of the survey in order to answer the questions (See Appendix A, B, C, D).

The questionnaire was designed to collect a large amount of data related to the attitudes of faculty members, and to determine the factors influencing the adoption of online tools into their teaching practice. The questionnaire instrument was constructed in four parts: (1) faculty demographic information, (2) technologies faculty use most with online teaching, (3) the use of online teaching and learning tools, and (4) utilization of online tools. The first and second sections of the survey instrument were focused on faculty demographics such as gender, age, academic rank, teaching experience, department or college, nationality, type of contract, and years of experience teaching online courses. Additional information about faculty's most used technologies (such as possession of personal home technology tools, provision of a university office computer, connection to the Internet at a university, and connection to the Internet at home) for online teaching were also collected. Items pertaining to faculty perceptions or challenges associated with using online teaching tools in their teaching practice were also included in the second section of the survey. A 5-point Likert-scale was used for participant

responses with 5=Always, 4=Mostly, 3=Moderate, 2=Seldom, and 1=Never (See Appendix B and D).

The third section of the instrument covered the terms used to explore factors influencing faculty to perceive opportunities related to utilizing online tools in their teaching practice (See Appendix A, B, C, and D). This section was constructed in four parts based on the DTPB model survey designed by Ajjan and Hartshorn (2008), and which included factors of attitudes, subjective norms, and perceived behavioral control (Figure 1). The four parts of the instrument were: (1) attitudes, (2) perceived behavioral control, (3) behavioral intentions, and (4) subjective norms (Table 1), and a 5-point Likert-scale was used for participant responses where Strongly Agree = 5, Agree = 4, Disagree = 3, Strongly Disagree = 2, and Don't Know = 1 (See Appendix B and D).

Table 1

The Constructs and Items of Section 3

Construct	Items
Actual usage	
AU1	I believe that I can communicate to my students about how to use online tools (e.g., communication tools, learning management systems (LMS) ...) in the classroom.
AU2	I would have no difficulty explaining why online tools (e.g., communication tools, learning management systems (LMS) ...) may or may not be beneficial.
Behavioral intention	
INT1	I will continue to use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

INT2 I will use online tools (e.g., communication tools, learning management systems (LMS) ...) within the next semester.

INT3 I will develop my skills with the use of online tools (e.g., communication tools, learning management systems (LMS) ...).

Attitude

ATT1 Online tools (e.g., communication tools, learning management systems (LMS) ...) are useful in my teaching practice.

ATT2 The advantages of using online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice outweigh the disadvantages of not using them.

ATT3 Using online tools (e.g., communication tools, learning management systems (LMS) ...) is a good idea.

Ease of use

EU1 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) is easy.

EU2 I feel that the use of online tools (e.g., communication tools, learning management systems (LMS) ...) will be easy to incorporate into my classroom environment.

Perceived usefulness

PU1 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will help my students learn more about the subject.

PU2 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will assist in improving students' satisfaction with the course.

PU3 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will assist in improving grades.

PU4 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will assist in improving students' evaluations of the course.

PU5 To help my students better learn the material, I will incorporate online tools (e.g., communication tools, learning management systems (LMS) ...) in the course.

Subjective norms

SN1 My peers are using online tools (e.g., communication tools, learning management systems (LMS) ...) in their teaching practice.

SN2 My superior confirms my ability and knowledge to use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

SN3 My peers think I will benefit from using online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

SN4 My superior thinks it is important that I use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

SN5 My students think it is important that I use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

Perceived behavioral control

PBC1 Using the online tools (e.g., communication tools, learning management systems (LMS) ...) is entirely within my control.

PBC2 I have the knowledge and ability to use online tools (e.g., communication tools, learning management systems (LMS) ...).

Peer influence

PI1 Peers who influence my behavior believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

PI2 Peers who are important to me believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

Superior influence

SUI1 My superior, who influences my behavior, believes that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

SUI2 My superior, whom I report to, believes that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

Student influence

SI1 Students, who influence my behavior, believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

SI2 Students, who are important to me, believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.

Compatibility

Comp1 Using online tools (e.g., communication tools, learning management systems (LMS) ...) is compatible with the way I teach.

Comp2 Using online tools (e.g., communication tools, learning management systems (LMS) ...) fits well with the way I teach.

Facilitating conditions technology and resources

FC1 The online tools (e.g., communication tools, learning management systems (LMS) ...) are compatible with the computer that I am already using in my teaching practice.

FC2 I can use online tools (e.g., communication tools, learning management systems (LMS) ...) when I use any computer connected to the Internet.

Self-efficacy

SE1 I would feel comfortable using online tools (e.g., communication tools, learning management systems (LMS) ...).

SE2 I could easily use online tools (e.g., communication tools, learning management systems (LMS) ...) in my own teaching practice.

Note: The Schedule Adapted from (Ajjan & Hartshorne, 2008).

The fourth section of the questionnaire was open-ended, with items exploring the factors influencing faculty utilization of online tools, such as the benefits and complexities that faculty face in their teaching practice.

Description of the Variables

The key study variables were:

- 1- The dependent variables.** There were three dependent variables for the study: (1) factors influencing faculty adoption of online teaching into the instructional process, (2) advantages and disadvantages of using online teaching in the instructional process, and (3) challenges of using online teaching in the instructional process at the three universities in Saudi Arabia.
- 2- The independent variables.** The independent variables for the study included demographics information such as: (1) gender, (2) age, (3) academic rank, (4) teaching experience, (5) department or college, (6) nationality, (7) type of contract, (8) possession of personal home technology tools, (9) provision of a university office computer, (10) connection to the Internet at a university, and (11) connection to the Internet at home.

Reliability and Validity

The definition of the term, “reliability” is the level at which a questionnaire instrument consistently measures what it is intended to measure (Slavin, 1992). If measurements from the instrument are consistent and accurate, the degree of reliability is high (Mueller, 1986). Yin (2003) also confirmed that reliability will, “minimize the errors and biases in a study” (p.37). The Alpha coefficient indicates the level at which reliability and validity are acceptable for instrument tools. Reliability (Cronbach’s Alpha) for the scale measuring the use of digital resources is given in Table 2. The reliability of the scale was found to be .979 indicating a highly reliable scale. The reliability indices (α) for all subscales were also found to be greater than 0.8 which shows highly reliable subscales (See Table 2).

Table 2***Reliability Analysis of Online Teaching and Learning Tools***

#	Subscale	# of items	M	SD	Cronbach α
1	Actual Usage	2	2.88	0.75	.749
2	Behavioral Intentions	3	2.90	0.82	.918
3	Attitude	3	2.86	0.85	.897
4	Ease of Use	2	2.84	.82	.852
5	Perceived Usefulness	5	2.84	0.81	.933
6	Subjective Norm	5	2.76	0.90	.924
7	Perceived Behavioral Control	2	2.83	0.84	.940
8	Peer Influence	2	2.75	0.83	.821
9	Superior Influence	2	2.66	0.92	.872
10	Student Influence	2	2.64	0.96	.917
11	Compatibility	2	2.77	0.95	.968
12	Facilitating conditions technology and Resources	2	2.84	0.86	.937
13	Self-efficacy	2	2.85	0.86	.852
	Total	34	2.81	0.72	.979

“Validity” refers to the degree to which a survey instrument measures something accurately (Slavin, 1992). Light et al. (1990) have reported that validity can be established by having, “experts examine the measure and agree that it does assess what it is supposed to assess” (p. 152). In order to establish validity for the survey instrument, all sections of the questionnaire

were developed by the researcher and reviewed by specialists from the Instructional Design and Technology department at Virginia Tech. An exception exists for section three, which was designed by Ajjan and Hartshorn (2008). In order to use this section, the researcher was able to obtain permission (See Appendix K).

Data Collection

Permission to conduct this study was granted through the Institutional Review Board at Virginia Tech (See Appendix G) and the Institutional Review Board office at King Faisal University (See Appendix I). This study used a mixed methods Convergent Parallel design (one phase) for data collection, and the researcher used the QuestionPro software provided by Virginia Tech to create the quantitative and qualitative questionnaire and consent form (See Appendix A, B, C and D).

The researcher prepared an email that included the consent form and the questionnaire link, and that explained the purpose of the study, the sample required, and how to contact the researcher. The email was translated into both the English and Arabic languages (See Appendix E and F). The researcher communicated with the Deanship of Scientific Research for each university, and completed the application requirements in order to obtain approval for conducting the study. Imam Abdulrahman bin Faisal University and the University of Bisha required permission from the Institutional Review Board at Virginia Tech prior to sending a letter of approval (See Appendix H and J). However, King Faisal University required permission from their specific Institutional Review Board office in order to approve the distribution of the questionnaire (See Appendix I). The survey was sent through the Dean of Faculty Affairs at King Faisal University (KFU), Imam Abdulrahman bin Faisal University (IAU), and the University of Bisha (UB) on behalf of the researcher. Participants were reminded that participation was

voluntary, their data would be confidential, their responses would not be used for other purposes, and that they were able to withdraw at any time. Additionally, the questionnaire was provided in both Arabic and English to allow participants to choose their desired language (See Appendix A, B, C, and D).

Once the participants completed the survey instrument, they moved on to the open-ended questions, which formed the qualitative section. The qualitative portion of the survey included eight open-ended questions about the participant's experiences utilizing online teaching. This approach was focused on answering the third research question.

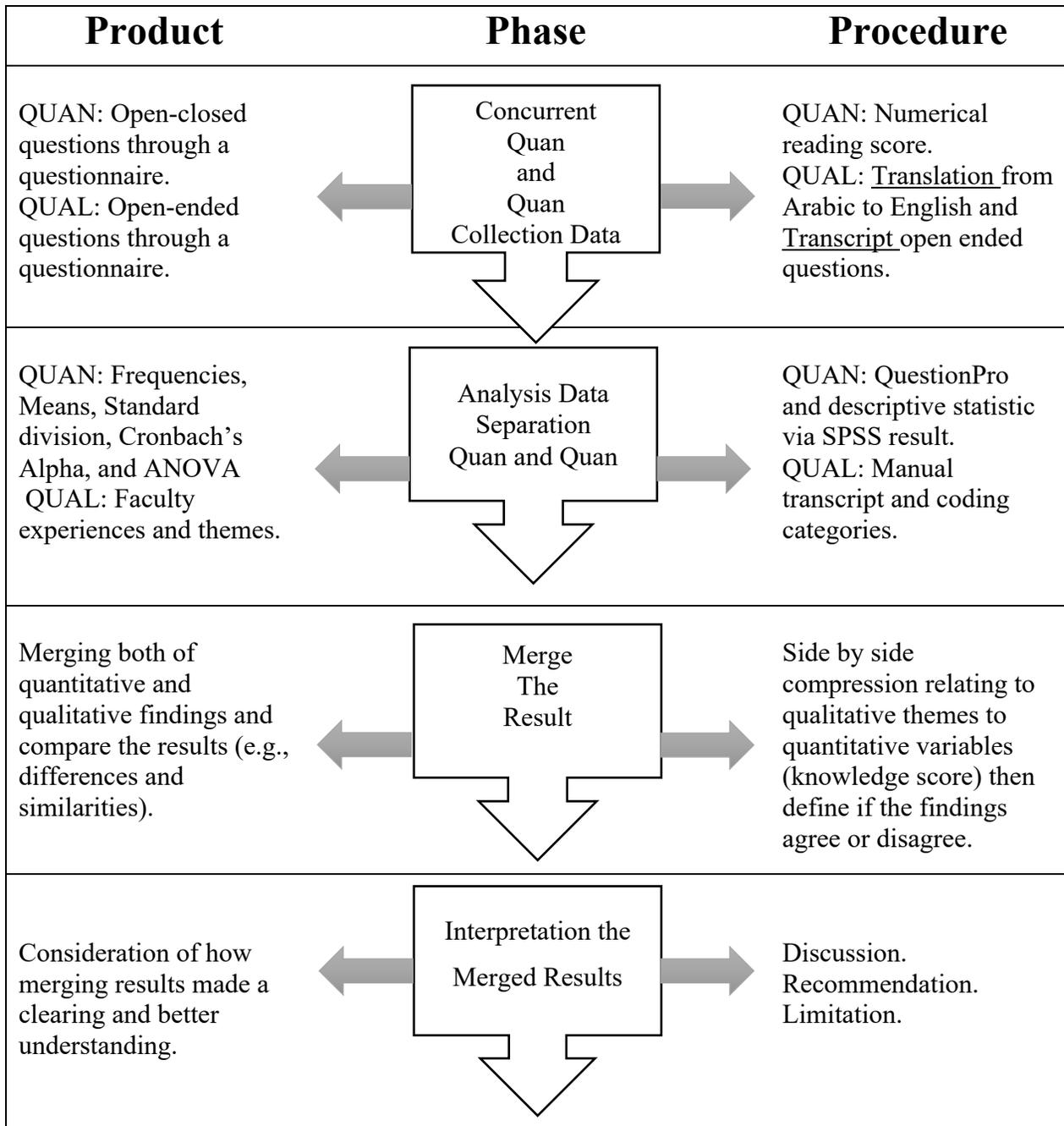
Data Analysis

After the participants completed the survey, the quantitative and qualitative data analysis were conducted separately. Creswell and Creswell (2017) have clarified that data analysis for Convergent Parallel designs goes through three stages, and is called a side-by-side comparison approach. First, the quantitative data were analyzed via Statistical Package for Social Sciences software (SPSS). Second, the quantitative data were analyzed using descriptive statistics for frequency, means, standard deviation, ANOVA, and percentage. The qualitative data were analyzed through categorizing verbal data in order to classify, summarize, and tabulate responses. According to Creswell and Creswell (2017), several steps are involved when analyzing qualitative data. These include organizing and preparing the data for analysis, reading and looking through all the data, coding all the data, generating and describing the data through identifying categories and themes, and representing the description and themes. Quantitative and qualitative data findings were merged in the discussion chapter, and results were interpreted regarding faculty attitudes and influences impacting the adoption of online teaching. The

following diagram presents an explanation of data analysis based on a convergent parallel design from Creswell and Clark (2017).

Figure 4

Diagram Procedure for a Study That Used Convergent Parallel Design



Note. Diagram Procedure for a Study That Used Convergent Parallel Design. Adapted from Designing and Conducting Mixed Methods Research (3rd ed., P. 76), by Creswell and Clark, 2017, Sage. Adapted with permission.

Summary

This chapter has presented an outline of the methodology used to investigate the factors and challenges influencing faculty member adoption of online teaching into teaching practice at Saudi universities. In order to best answer the research questions for this descriptive study, the researcher has chosen a mixed-methods, convergent parallel design. The convergent parallel design makes use of one data collection phase, and was chosen based on the mixture of quantitative and qualitative research questions. Quantitative and qualitative data were analyzed separately. Subsequently, the data were merged side by side and compared in order to examine any differences and similarities. The interpretation of the merged findings is presented through the discussion, limitations, and recommendations from the data.

This chapter has also presented the instrument used to collect data for this descriptive study. The instrument included both closed and open-ended questions. The reliability and validity of the instrument were also discussed. Finally, the chapter clarified the process of collecting and analyzing qualitative and quantitative data used for this descriptive study.

CHAPTER 4

MIXED METHODS DATA ANALYSIS

Introduction

The purpose of this descriptive study was to determine the factors and challenges influencing faculty members' use of online teaching in their teaching practice at three different Saudi universities. The research findings from this descriptive study are presented to highlight responses from the faculty in terms of demographics, as well as their perspectives on the advantages of implementing online tools in their teaching practice. These findings are presented based on the research questions, hypotheses, and methodology previously outlined for this study, descriptive statistics related to the quantitative analysis, as well as descriptive themes related to the qualitative analysis.

Research Questions

This study was designed to answer three quantitative and qualitative questions:

- 1- What differences in Saudi faculty members' use of online tools can be associated with demographic variables such as gender, age, academic rank, teaching experience, department or college, nationality, and type of contract, and other factors such as possession of at-home technology tools, provision of a university office computer, Internet access at a university, and Internet access at home?
- 2- What are the perceived opportunities for faculty members using online teaching in the instructional process?
- 3- How do faculty members rate the perceived challenges associated with using online teaching in the instructional process?

Descriptive Statistics

The researcher collected data from 124 faculty working in various departments and fields of study (e.g., social sciences, arts, commerce, business administration, physical and biological sciences) at IAU, KFU, and UB. There were 14 responses that were excluded due to being incomplete. This section provides the sample demographics and other statistical results for each research question quantitatively and qualitatively. The quantitative and qualitative findings are presented separately in this chapter.

Demographics (Quantitative)

The demographic information collected from participants and presented here includes their gender, age, academic rank, department and college, nationality, and type of contract. Additionally, tables are included to present information about participant use and availability of online teaching tools and digital resources at home, or at their universities to prepare and deliver instruction.

Table 3

Percentage of Participants by University

University	N	%
1 Imam Abdulrahman bin Faisal University	49	39.5
2 King Faisal University	41	33.1
3 University of Bisha	34	27.4

Table 3 shows that most faculty participants belonged to Imam Abdulrahman bin Faisal University (39.5%), followed by King Faisal University (33.1%), and the University of Bisha (27.4%).

Table 4

Gender

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Gender	Male	19	38.8	18	43.9	12	35.3
	Female	30	61.2	23	56.1	22	64.7

Table 4 provides the distribution across each of the three universities for faculty gender. Gender distribution was similar from all three universities with a female majority at Imam Abdulrahman bin Faisal University (61.2%), King Faisal University (56.1%), and University of Bisha (64.7%).

Table 5

Age

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Age	21-24 years	4	8.2	1	2.4	2	5.9
	25-30 years	16	32.7	6	14.6	7	20.6
	31-40 years	15	30.6	6	14.6	7	20.6
	41-45 years	8	16.3	11	26.8	9	26.5
	46-50 years	5	10.2	14	34.1	5	14.7
	51-55 years	1	2.0	1	2.4	3	8.8

56 years and above	4	8.2	2	4.9	1	2.9
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Table 5 presents information on faculty age. The majority of faculty participants at Imam Abdulrahman bin Faisal University fell within the age group of 25-30 years (32.7%), followed by 31-40 years (30.6%). At King Faisal University, the majority of faculty participants were between 46-50 years (34.1%), followed by 41-45 years (26.8%). At University of Bisha the majority of faculty participants fell within the age group of 41-45 years (26.5%), followed by 31-40 years (20.6%) and 25-30 years (20.6%).

Table 6

Academic Rank

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Academic Rank	Teaching Assistant	2	4.1	3	7.3	3	8.8
	Lecturer	13	26.5	6	14.6	12	35.3
	Assistant Professor	19	38.8	12	29.3	14	41.2
	Associate Professor	14	28.6	16	39.0	4	11.8
	Professor						
	Professor	1	2.0	4	9.8	1	2.9

Table 6 indicates faculty rank. Assistant professors made up the majority of participants from Imam Abdulrahman bin Faisal University (38.8%) and University of Bisha (41.2%), whereas at King Faisal University, associate professors made up the majority of participants (39.0%).

Table 7

Teaching Experience

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Teaching Experience	Less than 5 years	5	10.2	5	12.2	8	23.5
	5-9 years	19	38.8	12	29.3	15	44.1
	10-14 years	17	34.7	17	41.5	5	14.7
	15-19 years	4	8.2	7	17.1	3	8.8
	20-24 years	4	8.2			3	8.8

Table 7 presents faculty teaching experience. The highest number (41.5%) of experienced faculty (10-14 years) participated from King Faisal University, followed by 29.3% with 5-9 years of experience. At Imam Abdulrahman bin Faisal University, the majority of faculty participants (38.8%) had 5-9 years of experience, followed by 10-14 years (34.7%). At the

University of Bisha, the majority of faculty participants (44.1%) had 5-9 years of experience, followed by 5 years or less (23.5%).

Table 8

Department or College

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Department	Arts and Social	18	36.7	11	26.8	26	76.5
Or College	Sciences						
	Business and Accounts	5	10.2	8	19.5	2	5.9
	Physical and Biological Sciences	26	53.1	22	53.7	6	17.6

Table 8 indicates faculty department or college. 76.5% of faculty participants from University of Bisha were from the Faculty of Arts and Social Sciences. At Imam Abdulrahman bin Faisal University (53.1%) and King Faisal University (53.3%), the majority of faculty belonged to the Faculty of Physical and Biological Sciences.

Table 9

Nationality

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Nationality	Saudi	36	73.5	27	65.9	23	67.6
	Non-	13	26.5	14	34.1	11	32.4
	Saudi						

Table 10

Type of Contract

		Imam Abdulrahman bin Faisal University N = 49		King Faisal University N = 41		University of Bisha N = 34	
Variable	Categories	N	%	N	%	N	%
Type of Contract	Non- renewable	35	71.4	25	61.0	23	67.6
	Renewable	14	28.6	16	39.0	11	32.4

The majority of faculty participants were Saudi citizens with non-renewable contracts at all three universities: Imam Abdulrahman bin Faisal University (Saudi: 73.5%, Non-renewable

contract: 71.4%), University of Bisha (Saudi: 65.9%, Non-renewable contract: 61%), and King Faisal University (Saudi: 67.6%, Non-renewable contract: 67.6%) as shown in Table 9 and 10.

Table 11

Use of Online Teaching Tools and Digital Devices for Instructional Preparation at the Three Universities

Type of Resource	Instructional Preparation																
	Imam Abdulrahman bin Faisal University N = 49					King Faisal University N = 41					University of Bisha N = 34						
	0	1	2	3	4	5	1	2	3	4	5	0	1	2	3	4	5
University-Provided																	
Desktop	1	8	3	7	16	14	4	2	4	14	17	0	6	3	3	10	12
Laptop	1	16	2	2	13	15	2	3	9	12	15	0	7	4	4	7	12
Cell Phone	1	31	2	2	8	5	24	21	6	9	0	1	25	2	1	4	1
Tablet	1	24	3	5	10	6	11	3	8	16	3	1	13	1	9	9	1
Personal																	
Desktop	0	10	2	9	16	12	7	2	9	13	10	0	3	2	4	12	13
Laptop	1	1	3	2	14	28	0	1	8	14	18	0	0	3	1	10	20
Cell Phone	1	15	5	6	10	12	18	2	8	13	0	1	15	4	3	5	6
Tablet	1	12	5	4	14	13	6	3	8	16	8	1	6	3	8	11	5

*Note. Means:0= No Answer 1= Never used, 2=Seldom used, 3= Moderately used, 4= Mostly used, 5= Always used.

Table 11 provides frequencies for faculty participant use of university-provided and personal resources for instructional preparation at the three universities. The first section of Table 11 shows the university-provided digital resources for instructional preparation. Desktop computers were most frequently used by the highest proportion of faculty at King Faisal University (n = 17, 41.46%) followed by University of Bisha (n = 12, 35.29%) and Abdulrahman bin Faisal University (n = 16, 28.57%). Similarly, the use of university-provided laptops was highest for King Faisal University (n = 15, 36.59%) and Abdulrahman bin Faisal University (n = 16, 30.61%), followed by University of Bisha (n = 12, 35.29%). Cell phones were least frequently used at the universities. Faculty at the Abdulrahman bin Faisal University had the highest percentage of “never used” responses (n = 31, 63.27%) followed by University of Bisha (n = 25, 73.53%), and King Faisal (n = 24, 58.54%). Use of tablets was least frequent at Imam Abdulrahman bin Faisal University, with a high percentage of faculty indicating that they “never used” tablets (n = 24, 48.98%). At King Faisal University, the highest number of faculty participants indicated that they “mostly used” university-provided tablets (n = 19, 34.1%), and at University of Bisha most faculty indicated that tablets were “never used” (n = 13, 38.24%).

The number of faculty indicating that personal desktop computers for instructional preparation were “always used” was highest for Abdulrahman bin Faisal University (n = 16, 32.65%) followed by the University of Bisha (n = 13, 38.24%), and King Faisal University (n = 13, 31.71%). The number of faculty indicating frequent use of personal laptops was highest at the Imam Abdulrahman bin Faisal University (n = 28, 57.14%) followed by University of Bisha (n = 20, 58.82%), and King Faisal University (n = 18, 43.9%). The highest use of cell phones was at Abdulrahman bin Faisal University, with faculty participants indicating that they “always used” cell phones (n = 23, 46.9%). However, the highest number of faculty indicating that they

“never used” cell phones were from King Faisal University (n = 18, 43.9%) and University of Bisha (n = 15, 44.12%). The highest number of faculty indicated that tablets were “mostly used” at King Faisal University (n = 16, 39.02%) followed by Abdulrahman bin Faisal University (n = 14, 28.57%), and University of Bisha (n = 11, 32.35%).

Table 12

Use of Online Teaching Tools and Digital Devices for Instructional Delivery at the Three Universities

Type of Resource	Instructional Delivery																
	Imam Abdulrahman bin Faisal University N = 49					King Faisal University N = 41					University of Bisha N = 34						
	0	1	2	3	4	5	1	2	3	4	5	0	1	2	3	4	5
University-Provided																	
Desktop	2	13	3	6	13	12	4	2	6	13	16	0	10	4	0	7	13
Laptop	2	17	3	4	11	12	5	2	6	12	16	0	9	3	0	7	14
Cell Phone	2	31	1	4	6	5	25	2	3	11	0	1	24	2	0	6	1
Tablet	2	25	0	5	9	8	12	3	7	16	3	0	12	3	8	7	2
Personal																	
Desktop	0	10	4	6	13	16	8	1	9	11	12	0	4	4	2	9	15
Laptop	2	17	3	4	11	12	2	3	7	10	19	1	1	1	0	8	23
Cell Phone	2	17	4	4	12	10	23	1	6	11	0	0	16	5	0	6	6
Tablet	2	11	4	8	10	13	8	0	7	17	9	2	7	2	8	8	7

*Note. Means: 0= No Answer 1= Never used, 2=Seldom used, 3= Moderately used, 4= Mostly used, 5= Always used.

The use of university-provided and personal resources at three universities for instructional delivery is shown to vary in Table 12. The highest number of faculty indicating the frequent use of university-provided desktop computers (“always used”) was from King Faisal University (n = 16, 39.02 %) followed by the University of Bisha (n = 13, 38.24%). However, at Imam Abdulrahman bin Faisal University, equal numbers of faculty indicated that they “never used” and “mostly used” desktop computers (n = 13, 26.53 %). The use of the university-provided laptop was infrequent among faculty at Imam Abdulrahman bin Faisal University, with the highest number indicating that they never used them (n = 17, 34.69 %). By contrast, the highest number of faculty participants from King Faisal University (n = 16, 39.02%) and University of Bisha (n = 14, 41.18%) indicated that they “always used” university-provided laptops. University-provided cell phones were “never used” by the highest number of faculty for all three universities, at the Imam Abdulrahman bin Faisal University (n = 31, 63.27%), King Faisal University (n = 25, 60.98%), and University of Bisha (n = 24, 70.59%). Tablets were “never used” for instructional delivery by the highest number of faculty at Imam Abdulrahman bin Faisal University (n = 25, 51.02%) and University of Bisha (n = 12, 35.29%). However, the highest number of faculty at King Faisal University (n = 16, 39.02%) were found to “mostly use” university-provided tablets.

The data showed that the use of personal resources for instructional delivery was frequent, and that personal desktop computers were “always used” by a high number of faculty at the three universities, the highest from Imam Abdulrahman bin Faisal University (n = 16, 32.65%), followed by University of Bisha (n = 15, 44.12%), and King Faisal University (n = 12, 29.27%). Similarly, a high number of faculty indicated that they “always used” personal laptops at the University of Bisha (n = 23, 67.65%) and King Faisal University (n = 19, 46.34%).

However, the highest number of faculty at Imam Abdulrahman bin Faisal University indicated that they “never used” personal laptops (n = 17, 34.69%). Cell phones were “never used” among the highest number of faculty at King Faisal University (n = 23, 56.1%), followed by the Imam Abdulrahman bin Faisal University (n = 17, 34.69%) and University of Bisha (n = 16, 47.06%). Lastly, tablets were “mostly used” at King Faisal University (n = 17, 46.34%) and Imam Abdulrahman bin Faisal University (n = 10, 20.41%). However, an equal number of faculty at the University of Bisha indicated that they “never used” or “always used” personal tablets (n = 7, 20.59%).

Table 13

Access To Digital Resources for Instructional Preparation at the Three Universities

Type of Resource	Instructional Preparation															
	Imam Abdulrahman bin Faisal University N = 49					King Faisal University N = 41					University of Bisha N = 34					
	0	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
University-Provided																
DSL	2	6	5	8	11	17	2	4	5	15	15	3	4	4	13	10
WIFI	1	5	2	6	10	25	0	3	4	17	17	1	2	4	13	14
Personal																
WIFI	1	1	0	7	16	24	0	3	5	16	17	1	2	3	14	14
Mobile	1	3	6	9	12	17	1	5	7	16	12	1	3	7	13	10

*Note. Means: 0= No Answer 1= Never used, 2=Seldom used, 3= Moderately used, 4= Mostly used, 5= Always used.

For instructional preparation, university provided DSL was frequently used, with the highest number of faculty at Imam Abdulrahman bin Faisal University indicating that participants “always used” university-provided DSL (n = 17, 34.69%), followed by King Faisal University with equal numbers of faculty indicating that they “mostly used” or “always used” university-provided DSL (n = 15, 36.59%). At University of Bisha, the highest number of faculty indicated that they “mostly used” (n = 13, 38.24%) university-provided DSL. University-provided WIFI was most frequently “always used” by faculty at Imam Abdulrahman bin Faisal University (n = 25, 51.02%), whereas at King Faisal University an equal number of faculty indicated that they “always” and “mostly used” university WIFI access (n = 17, 41.46%). At University of Bisha, the highest number of faculty indicated that they “always used” university WIFI access (n = 14, 41.18%).

Personal WIFI was most frequently “always used” by faculty at Imam Abdulrahman bin Faisal University (n= 24, 48.98%) followed by faculty at King Faisal University (n = 17, 41.46%) and faculty at University of Bisha (n = 14, 41.18%). Similarly, the number of faculty using personal mobile resources to access the Internet for instructional preparation was highest at Imam Abdulrahman bin Faisal University (n = 17, 34.69%) followed by King Faisal University (n = 16, 39.02%) and University of Bisha (n = 10, 29.41%).

Table 14***Access to Digital Resources for Instructional Delivery at the Three Universities***

Type of Resource	Instructional Delivery															
	Imam Abdulrahman bin Faisal University N = 49					King Faisal University N = 41					University of Bisha N = 34					
	0	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
University-Provided																
DSL	1	8	2	10	12	15	2	3	7	14	15	2	5	3	12	11
WIFI	1	4	2	9	9	24	1	5	3	14	18	1	2	5	12	14
Personal																
WIFI	1	3	2	4	16	23	1	3	2	14	21	0	1	5	14	14
Mobile	1	5	9	5	11	17	4	2	5	17	13	1	4	5	15	9

*Note. Means: 0= No Answer 1= Never used, 2=Seldom used, 3= Moderately used, 4= Mostly used, 5= Always used.

For instructional delivery, the number of faculty “always” using university-provided DSL was highest at King Faisal University (n = 15, 36.59%) and the Imam Abdulrahman bin Faisal (n = 15, 30.61%). However, the highest number of faculty at University of Bisha indicated that they “mostly used” university-provided DSL for instructional delivery (n = 12, 35.29%). Use of university-provided WIFI was “always used” by the highest number of faculty at Imam Abdulrahman bin Faisal University (n = 24, 48.98%) followed by King Faisal University (n = 18, 43.9%) and the University of Bisha (n = 14, 41.18%).

Personal WIFI was “always used” among the highest number of faculty at Imam Abdulrahman bin Faisal University (n = 23, 46.94%) followed by the King Faisal University (n = 21, 51.22%). An equal number of faculty indicated that they “always” or “mostly used” personal

WIFI at University of Bisha (n = 14, 41.18%). Personal mobile phones were “always used” among faculty at Imam Abdulrahman bin Faisal University (n = 17, 34.69%), but were “mostly used” at both King Faisal University (n = 17, 41.46%) and University of Bisha (n = 15, 44.12%).

Quantitative Analysis (Research Question 1)

Research question 1 states: What differences in Saudi faculty members’ use of online tools can be associated with demographic variables such as gender, age, academic rank, teaching experiences, department or college, nationality, and type of contract, and other factors such as possession of at-home technology tools, provision of a university office computer, internet access at a university, and internet access at home?

Since this question included multiple variables, the best path to analyzing the data was through ANOVA. The ANOVA investigates and analyzes data in order to assess the effects of different factors (Lars & Wold, 1989). For question one, the researcher compared the independent variables such as gender, age, academic rank, teaching experience, department or college, nationality, and type of contract to the provision of a university office computer, possession of personal technology tools at home, connection to the Internet at a university, and connection to the Internet at home. The use of this method showed whether there were significant differences between the general demographic variables of faculty members, as well as variables in the use of and access to online teaching tools provided by universities or from home. Results pertaining to this question are found in eight comparison tables listed in two sections. Section one is a comparison of demographic variables and the use of university-provided resources in online teaching, and section two is a comparison of demographic variables and the use of personal resources in online teaching.

Comparison of Use of University-Provided Resources in Online Teaching

This section contains comparisons among multiple factors associated with university-provided digital resources that might be used in preparing and delivering instruction at three universities. The demographic factors included participant age, faculty department (i.e., Arts and Social Sciences, Business and Accounts, and Physical and Biological Sciences), faculty academic rank, teaching experience, gender, nationality (Saudi or non-Saudi members), and type of contract (renewable or non-renewable). The digital resources provided by the universities included desktop computers, laptops, tablets, cell phones, DSL Internet, and WIFI. The universities involved were Imam Abdulrahman bin Faisal University, King Faisal University, and the University of Bisha (See Tables 11, 12, 13, and 14). Where appropriate, responses were measured on a 5-point Likert-type scale (See Appendix B and D).

Table 15 shows that there were significant differences related to using university-provided resources in online teaching between faculty of different age groups (21-24 years), $F(6, 117) = 2.282, p = .040, \eta^2 = .105$. However, post hoc analysis did not indicate any significant group differences related to age.

Table 15

Group Comparisons by Age for Using University-Provided Teaching Digital Resources

Variables	Factors	Mean	SD	F	p	η^2
Age	21-24 years	3.39	.536	2.282	.040	.105
	25-30 years	3.33	.762			
	31-40 years	2.77	.932			
	41-45 years	3.40	.955			
	46-50 years	3.29	.828			
	51-55 years	3.50	1.021			

56 and above 2.39 .387

Table 16 shows that there were no significant differences in using university-provided resources across the three different universities, $F(2, 121) = 2.345, p = .100, \eta^2 = .037$. However, significant differences for using university-provided resources were found in three different departments among faculty members, $F(2, 121) = 7.788, p < .001, \eta^2 = .114$. A post hoc analysis indicated that the use of university-provided resources by faculty members in Physical and Biological Science ($M = 3.52, SD = .811$) was higher ($p < .001$) than that of faculty members from Arts and Social Sciences ($M = 2.87, SD = .966$). However, there were no significant differences between faculty members of Arts and Social Sciences ($M = 2.87, SD = .966$) and Business and Accounts ($M = 3.18, SD = .634$).

Table 16

Group Comparisons by University and Department for Using University-Provided Resources

Variables	Factors	Mean	SD	F	p	η^2
University	Imam Abdulrahman bin Faisal	3.034	1.079	2.345	.100	.037
	University					
	King Faisal University	3.44	.583			
	University of Bisha	3.13	.940			
Faculty (Department)	Arts and Social Sciences	2.87	.966	7.788	.000	.114
	Business and Accounts	3.18	.634			
	Physical and Biological Sciences	3.52	.811			

Table 17 shows that variation in the use of university-provided resources by faculty members of various academic ranks was not significant, $F(4, 119) = 2.415, p = .053, \eta^2 = .075$. However, the use of university-provided resources varied significantly based on the teaching experience level of faculty members $F(4.479, p = .002, \eta^2 = .131)$. Faculty with experience levels of 5-9 years: $M = 3.37, SD = .891, p = .012$, 10-14 years: $M = 3.29, SD = .868, p = .028$, and 15-19 years: $M = 3.43, SD = .847, p = .026$ were found to be significantly different from faculty with an experience level of 20-24 years: $M = 2.20, SD = .598$. However, no significant differences were found related to other experience levels.

Table 17

Group Comparisons by Academic Rank and Teaching Experience for Using University-Provided Resources

Variables	Factors	Mean	SD	F	p	η^2
Academic Rank	Teaching Assistant	3.06	.521	2.415	.053	.075
	Lecturer	3.12	1.017			
	Assistant Professor	2.97	1.003			
	Associate Professor	3.58	3.615			
	Professor	3.18	3.458			
Teaching Experience	Less than 5 years	2.73	.883	4.479	.002	.131
	5-9 years	3.37	.891			
	10-14 years	3.29	.868			
	15-19 years	3.43	.847			
	20-24 years	2.20	.598			

Table 18 shows that using university-provided resources was not significantly different based on gender, $t(122) = .992$, $p = .321$, $d = .183$, nationality, $t(122) = .567$, $p = .572$, $d = .110$, or contract type, $t(122) = .667$, $p = .500$, $d = .129$.

Table 18

Group Comparison by Gender, Nationality, and Contract of Type for Using University-Provided Resources

Variables	Factors	Mean	SD	F	p	η^2
Gender	Male	3.09	.917	.992	.321	.183
	Female	3.26	.913			
Nationality	Saudi	3.22	.952	.567	.572	.110
	Non-Saudi	3.12	.823			
Type of Contract	Non-renewable	3.23	.967	.667	.500	.129
	Renewable	3.11	.797			

Comparison of Use of Personal Digital Resources for Online Teaching

This section contains comparisons among multiple factors associated with personal digital resources that might be used for preparing and delivering instruction at three universities. The demographic factors included participant age, faculty department (i.e., Arts and Social Sciences, Business and Accounts, and Physical and Biological Sciences), faculty academic rank, teaching experience, gender, nationality (Saudi or non-Saudi members), and type of contract (renewable or non-renewable). The personal digital resources that could be used in preparing and delivering instruction included desktop computers, laptops, tablets, cell phones, DSL Internet, and WIFI. The three universities involved included Imam Abdulrahman bin Faisal University,

King Faisal University, and the University of Bisha (See Tables 11, 12, 13, and 14). Where appropriate, responses were measured on a 5-point Likert-type scale (See Appendix B and D).

Table 19 shows that there were no significant differences for the use of personal resources in online teaching found in relation to age, $F(6, 117) = 1.614, p = .149, \eta^2 = .076$.

Table 19

Group Comparisons by Age for Using Personal Resources

Variables	Factors	Mean	SD	F	p	η^2
Age	21-24 years	3.86	.127	1.614	.149	.076
	25-30 years	3.63	.551			
	31-40 years	3.49	.537			
	41-45 years	3.68	.765			
	46-50 years	3.67	.456			
	51-55 years	3.60	.901			
	56 and above	2.75	.707			

Table 20 shows that there were no significant differences in using personal resources at three different universities, $F(2, 121) = .348, p = .707, \eta^2 = .006$. However, significant differences for using personal resources for online teaching were found by department, $F(2, 121) = 3.539, p = .032, \eta^2 = .144$. A post hoc analysis did not reveal any significant group differences across all three departments or colleges for using personal resources.

Table 20

Group Comparisons by University and Faculty Type for Using Personal Resources

Variables	Factors	Mean	SD	F	p	η^2
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University	Imam Abdulrahman bin Faisal	3.61	.699	.348	.707	.006
	University					
	King Faisal University	3.54	.568			
	University of Bisha	3.66	.639			
Faculty (Department)	Arts and Social Sciences	3.50	.664	3.539	.032	.144
	Business and Accounts	3.36	.564			
	Physical and Biological Sciences	3.76	.599			

Table 21 indicates that there were no significant differences found for using personal resources based on faculty member academic rank, $F(4, 119) = .126, p = .973, \eta^2 = .075$ and experience level, $F(4, 119) = 1.451, p = .221, \eta^2 = .047$.

Table 21

Group Comparisons by Faculty Rank and Experience for Using Personal Resources

Variables	Factors	Mean	SD	F	p	η^2
Academic Rank	Teaching Assistant	3.69	.656	.126	.973	.075
	Lecturer	3.59	.603			
	Assistant Professor	3.59	.643			
	Associate Professor	3.61	.703			
	Professor	3.46	.539			
Teaching Experience	less than	3.55	.524	1.451	.221	.047
	5 years					
	5 - 9 years	3.69	.598			
	10 - 14 years	3.54	.608			

15 - 19 years	3.76	.518
20 - 24 years	3.14	1.256

Table 22 shows that there were no significant differences in using personal resources based on gender, $t(122) = 1.413$, $p = .160$, $d = .260$. However, significant differences in using personal resources were found for nationality, $t(122) = 2.486$, $p = .014$, $d = .484$, and contract type, $t(122) = 3.101$, $p = .002$, $d = .592$. Overall, Saudi faculty use significantly more personal resources ($M = 3.69$, $SD = .577$) than non-Saudi faculty ($M = 3.38$, $SD = .724$). Similarly, faculty with non-renewable contracts used personal resources more ($M = 3.72$, $SD = .558$) than those with renewable contracts ($M = 3.35$, $SD = .723$).

Table 22

Group Comparison by Faculty Nationality and Contract Type for Using Personal Resources

Variables	Factors	Mean	SD	t	p	d
Gender	Male	3.49	.680	1.413	.160	.260
	Female	3.66	.605			
Nationality	Saudi	3.69	.577	2.486	.014	.484
	Non-Saudi	3.38	.724			
Contract	Non-renewable	3.72	.558	3.101	.002	.592
	Renewable	3.35	.723			

Quantitative Analysis (Research Question 2)

Research question 2 states: What are the perceived opportunities for faculty members using online teaching in the instructional process?

Table 23 shows the perceived usage of online resources (M = 2.81, SD = 0.72) with varying levels associated with multiple factors. The factors of behavioral intention (M= 2.90, SD = 0.82), actual usage (M = 2.88, SD = 0.75), attitude (M = 2.86, SD = 0.85), ease of use (M = 2.84, SD = 0.82), and perceived usefulness (M = 2.84, SD = 0.81) showed moderate levels for online usage of resources. The lower levels for perceived usage were found for the factors of superior influence (M = 2.66, SD = 0.92) and student influence (M = 2.64 SD = 0.96). Additionally, Table 23 indicates frequency counts for the perceived usage of online teaching tools and resources.

Table 23

Perceived Usage of Online Resources

#	Subscale	M	SD
1	Actual Usage	2.88	0.75
2	Behavioral Intention	2.90	0.82
3	Attitude	2.86	0.85
4	Ease of Use	2.84	0.82
5	Perceived Usefulness	2.84	0.81
6	Subjective Norms	2.76	0.90
7	Perceived Behavioral Control	2.83	0.84
8	Peer Influence	2.75	0.83
9	Superior Influence	2.66	0.92
10	Student Influence	2.64	0.96
11	Compatibility	2.77	0.95
12	Facilitating Conditions, Technology, and Resources	2.84	0.86

13	Self-efficacy	2.85	0.86
	Total	2.81	0.72

Table 24 presents frequencies for factors affecting the use of online teaching tools by faculty members at the three universities (IAU, KFU, UB). In Table 23, the percentages show total proportions for responses of “Agree” and “Strongly Agree,” which were the highest. Therefore, according to Table 23 for the factor of Actual Use, a majority of faculty members (83.1%) at the three universities showed agreement for communicating with students through online tools, and 77.4% of faculty members did not experience any difficulty explaining the benefits of online tools.

For the Behavioral Intention factor, 79.1% of faculty members indicated agreement with continuing to use online tools in teaching, and 78.2% indicated that they would continue using digital tools within the next semester. A majority of faculty members (83.1%) agreed that they would keep developing their skills in using online tools.

For the factor of Attitude, 83.9% of faculty members indicated that online tools were useful for teaching practice, and 73.4% of faculty members found that the advantages of using online tools outweighed the disadvantages of not using them. 80.7% of faculty members indicated that using online tools was a good idea.

For the factor Ease of Use, 78.2% of faculty members found it easy to use online tools, and 79% of faculty members considered them easy to incorporate into teaching practice.

For Perceived Usefulness, 78.3% of faculty members felt that using online tools would be helpful for their students, and 79.9% felt that online tools would improve student satisfaction. A majority of faculty members also indicated that they felt online tools would improve student

grades (75.8 %,) and course evaluations (76.6%). Similarly, 81.5% of faculty members indicated that they felt students learned better with online tools.

In regards to Subject Norms, 78.2% of faculty members thought their colleagues were using online learning tools, and 77.5% believed that their abilities to use these online tools were confirmed by their superiors. 76.6% of faculty members indicated that they would benefit from online tools, as perceived by their peers. Faculty members indicated that they used tools, as their superiors (80.6%) and students (79.8) wanted them to do so.

For Perceived Behavioral Control, 76.6% of faculty members indicated that they had control of online tools, and 79% of faculty members believed that they had the knowledge and ability to use online tools.

In the case of Peer Influence, 75.8% of faculty members indicated that peers influenced them to use online tools and considered them important (77.4%) to use in online teaching.

Superiors also Influenced the Behavior (74.2%) of faculty members, who indicated that their immediate bosses believed (74.25%) that faculty members should use online tools in their teaching practice.

For Student Influence, faculty indicated that student behavior influenced them (74.2%) to use online tools, and 71.8% of faculty members were convinced by good students who urged them to use online teaching tools.

Compatibility was determined by two items. 75.8% of faculty members indicated that online teaching tools were compatible with their teaching practice, and 80.6% indicated that these tools fit well within their current teaching practice.

In regard to Facilitating Conditions, Technology, and Resources, faculty indicated that (79%) they found online tools to be compatible with their computers, and 80.6% of faculty members were able to use online tools when their computers were connected with Internet.

Lastly for Self-Efficacy, faculty members indicated that they had the ability (80.3%) to use online tools in their teaching, and that it would be relatively easy (76.7%).

Table 24

Frequency Counts for Perceived Usage of Online Teaching Resources

Statement	SD	D	A	SA	DK
Actual Usage					
AU1	5, 4.0%	14, 11.3%	79, 63.7%	25, 19.4%	2, 1.6%
AU2	10, 8.1%	15, 12.1%	76, 61.3%	20, 16.1%	3, 2.4%
Behavior					
INT1	8, 6.5%	15, 12.1%	73, 58.9%	25, 20.2%	3, 2.4%
INT2	7, 5.6%	17, 13.7%	74, 59.7%	23, 18.5%	3, 2.4%
INT3	8, 6.5%	10, 8.1%	75, 60.5%	28, 22.6%	3, 2.4%
Attitude					
ATT1	8, 6.5%	9, 7.3%	76, 61.3%	28, 22.6%	3, 2.4%
ATT2	5, 4.0%	22, 17.7%	67, 54.0%	24, 19.4%	6, 4.8%
ATT3	7, 5.6%	11, 8.9%	75, 60.5%	25, 20.2%	6, 4.8%
Ease of Use					
EU1	7, 5.6%	16, 12.9%	77, 62.1%	20, 16.1%	4, 3.2%
EU2	8, 6.5%	15, 12.1%	75, 60.5%	23, 18.5%	3, 2.4%

Perceived Usefulness

PU1	13, 10.5%	11, 8.9%	72, 58.1%	25, 20.2%	3, 2.4%
PU2	9, 7.3%	12, 9.7%	74, 59.7%	25, 20.2%	4, 3.2%
PU3	11, 8.9%	16, 12.9%	73, 58.9%	12, 16.9%	3, 2.4%
PU4	8, 6.5%	17, 13.7%	72, 58.1%	23, 18.5%	4, 3.2%
PU5	7, 5.6%	13, 10.5%	77, 62.1%	24, 19.4%	3, 2.4%

Subjective Norms

SN1	6, 4.8%	12, 9.7%	75, 60.5%	22, 17.7%	9, 7.3%
SN2	8, 6.5%	8, 6.5%	61, 57.3%	26, 20.2%	12, 9.7%
SN3	8, 6.5%	12, 9.7%	76, 61.3%	19, 15.3%	9, 7.3%
SN4	10, 8.1%	8, 6.5%	78, 62.9%	22, 17.7%	6, 4.8%
SN5	6, 4.8%	14, 11.3%	79, 63.7%	20, 16.1%	5, 4.8%

Perceived Behavioral**Control**

PBC1	5, 4.0%	20, 16.1%	76, 61.3%	19, 15.3%	4, 3.2%
PBC2	6, 4.8%	16, 12.9%	79, 62.9%	20, 16.1%	4, 3.2%

Peer Influence

PI1	7, 5.6%	19, 15.3%	76, 61.3%	18, 14.5%	4, 3.2%
PI2	8, 6.5%	14, 11.3%	82, 66.1%	14, 11.3%	6, 4.8%

Superior Influence

SUI1	9, 7.3%	15, 12.1%	78, 62.9%	14, 11.3%	8, 6.5%
SUI2	9, 7.3%	16, 12.9%	78, 62.9%	14, 11.3%	7, 5.6%

Student Influence

SI1	7, 5.6%	16, 12.9%	79, 63.7%	13, 10.5%	9, 7.3%
SI2	6, 4.8%	20, 16.1%	74, 59.7%	15, 12.1%	9, 7.3%
<hr/> Compatibility					
COM1	8, 6.5%	14, 11.3%	74, 59.7%	20, 16.1%	8, 6.5%
COM2	6, 4.8%	16, 12.9%	77, 62.1%	21, 16.1%	5, 4.0%
<hr/> Facilitating Conditions, Technology, and Resources					
FC1	8, 6.5%	14, 11.3%	76, 61.3%	22, 17.7%	4, 3.2%
FC2	7, 5.6%	13, 10.5%	80, 64.5%	20, 16.1%	4, 3.2%
<hr/> Self-efficacy					
SE1	7, 5.6%	17, 13.7%	74, 59.7%	25, 19.4%	2, 1.6%
SE2	6, 4.8%	16, 12.9%	70, 56.5%	25, 20.2%	7, 5.6%

Note. SD = Strongly Disagree, D = Disagree, A= Agree, SA =Strongly Agree, DK = I Don't Know

Qualitative Analysis (Research Question 3)

Qualitative data were analyzed to answer the third research question, which stated: How do faculty members rate the perceived challenges associated with using online teaching in the instructional process?

The analysis of faculty responses regarding their experiences using online resources for preparing online courses was first conducted broadly using various categories (See Appendix M for Codebook). The thematic analysis involved aggregating the categories based on similarities and common thoughts in order to merge them into comprehensive ideas reflecting meaningful

ideas. The categories are presented in Table 24 with descriptions and percentages for respondents within each area.

Qualitative Question 1 (Section Two of the Instrument)

In this part of the qualitative analysis, data were analyzed from two qualitative questions from section two of the instrument. Quotes are provided to support the statements.

Question 1 read: What experiences have you had when preparing for teaching online courses? (For example: When preparing presentations for my upcoming classes, I often search for relevant images to use as part of my instruction. I have learned it frequently takes a very long time to locate useful images on the Internet and to download the images after I find them. Another lesson I learned when preparing for teaching online courses is how important it is to organize my saved files so I can easily find them when they are needed).

Table 25

Categories for Online Teaching Experiences in Preparing Online Instruction

Categories	Description	Number and Percentage
Media and Scientific Material	Use of media, PPT, videos, maps, photos and graphics, and research articles journals, other readily available material supporting course content.	N=42, 33.8 %
Easy, Quick, and Accurate	Faster mode of communication with students, data transferring such as assignments, files uploading, time saving and accurate.	N= 31, 25 %
Interactive	Interactive mode of learning and communicating with students virtually especially online teaching. It is easy to	N= 20, 16.2 %

	control white board on online, plan ahead and save resources for the future use.	
Complex and Time-Consuming	Laborious and complicated, preparing online course are time consuming compared to traditional teaching, takes time to locate content, prepare slides, find relevant videos and supporting material. Needs training to use online resource and use for teaching.	N= 31, 25 %

The analysis revealed four broader categories as shown in Table 25: Media and Scientific Material, Easy, Quick, and Accurate, Interactive, and Complex and Time-Consuming. For Media and Scientific Material, 33.8% of faculty indicated that they prepared PowerPoint presentations (PPT), YouTube videos, maps, pictures, and photos to enrich their online courses. The faculty downloaded ready-made PowerPoint (PPT) presentations to supplement their classes, and to motivate and engage students. One faculty member stated that they, “Make PowerPoint presentations and use images and stickers to grab attention.” Faculty also located online journal articles, reading content, and other scientific materials to use in their instructions: “Relying on reliable scientific sources, often searching through a Google engine ---the a specialization is a good option as well as providing references before the start of the semester (such as book mothers – and modern references) saves time when preparing the instructions in addition to raising the value of the scientific material presented.”

Similarly, 25% of faculty that used online teaching tools stated that they provided a quick, faster mode of communication, allowing them to transfer and upload their data files from storage materials: “When I prepare my instructions, I used to arrange my documents and files in

the USB to protect them from loss, so that I renew and develop my files for courses every year, as they are not similar to the documents of the previous year.” Additionally, faculty who used online teaching tools were able to post content for online courses at the beginning of the semester. One participant stated that they, “Make sure to upload all assignments early at the beginning of the semester to make them clear to students and remove frequently asked questions related to homework.”

Faculty also indicated that they could save their material for future use, and use previous materials they developed for their concurrent and future courses and classes. One participant stated, “When preparing online instructions, I used to upload presentations early to allow learners to look at them and prepare questions early.” Faculty also indicated that they used teaching tools to enhance research skills through explaining to their students how they could use them: “To promote scientific research for students, it made me assign them research tasks, and this made me organize my documents clearly and explain to them my way of arranging and using scientific research programs such as Endnote and explaining it to them in a simple way.”

16.2% of faculty found online teaching to be very interactive: “When preparing online instructions, make sure to create an attractive presentation that helps me make the instruction interactive.” Additionally, faculty found that teaching tools fostered multi-tasking, allowing them to use various interactive tools such as digital whiteboards to depict material on screen as quick references for students. This allowed for prompt visual presentation and easy communication. A participant stated, “I use the notability program on the iPad that enables me to write directly on a whiteboard, I do not share any pictures or PowerPoint presentations.”

25% of faculty members indicated that finding relevant and specific content for instructions and preparing PowerPoint presentations were time-consuming and complicated

processes that required extra effort. Therefore, they planned ahead and started preparing their instructions early to avoid delays at the beginning of the semester. One participant stated, “This makes me take a long time to start the class and great effort and the cost of communication is high to be ready in front of the learners.” Some faculty members were inexperienced, lacked the knowledge to browse materials, and use online tools to prepare their online courses: “Certainly, the time I spend designing and preparing instruction content is three times as much as it takes another member to give his instruction to the same content in a traditional way.” Another faculty member stated, “Preparing online courses and instructions takes time and effort from me”.

Likewise, faculty indicated that their experiences with using online teaching tools were more time consuming when uploading videos and audio to the platform: “When I teach online instructions and courses, I take time to upload the instruction videos, filter the audio, and upload it to the podium.” Some other faculty members maintained the perspective that using online teaching tools for their courses was time-consuming and more effort. One participant stated, “My experience in using online teaching and learning tools in preparing my courses took a long time in preparing modern research articles and trends in the course in order to enrich knowledge.” Therefore, faculty members recognize that there are necessary skills and training involved with using digital and online tools. Some teachers get assistance from colleagues in preparing for their online instructions: “I needed to take a training course that would help me in using distance learning strategies and their effectiveness, and I used and applied them with satisfaction.” Another participant stated, “Presentations take effort and time from me, which made me use ready-made templates and ask for help from my colleagues in the department.”

Qualitative Question 2 (Section Two of the Instrument)

Question 2 read: What online teaching experiences have you had when delivering online instruction in online courses? (For example: I can tell from the questions my students ask that the images I share when delivering my online instruction serve an instrumental purpose).

The faculty members' responses regarding their experiences delivering online instruction via online teaching practices were coded and categorized based on commonalities in the codes that described similar opinions for delivering online instructions (See Appendix M code book). The thematic analysis involved aggregating the categories for their similarities and working towards the development of a broad common theme. These categories are presented in Table 26 with descriptions and the percentages for respondents within each component.

Table 26

Categories of Online Teaching Experiences for Delivering Online Instruction

Categories	Description	Number and Percentage
Content Quality	Use of media, PowerPoint presentations (PPT), videos, maps, photos and graphics, and research articles journals to motivate and gain attention of students. It includes course content sharing with students including PowerPoint presentations, study material or books. It also includes the use of various educational applications.	N= 45, 36.1 %
Interactive Mode	Interactive mode of learning and communicating with students virtually. It engages students in discussion, active participation, self-learning, and collaborative	N= 73, 59.8 %

	learning using e-learning strategies. It helps to attain educational outcomes and easy and convenient way to engage students.	
Complex and Time-consuming	Complicated and time-consuming process of preparing online course (e.g., locating relevant content, presentation slides, YouTube maps, charts, and other supporting materials).	N= 6, 4.1 %

Table 26 indicated that 36.1% of faculty found online teaching tools useful for delivering quality content, such as PowerPoint (PPT) presentations, videos, maps, photos, and research articles shared with students on various course topics. One participant stated, “Presentations help to present brief content to students when teaching distance courses and my presence together.” Another responded, “When I teach my courses as online instructions, I make sure to make visual presentations and videos to attract the attention of the students and give them an opportunity to think and analyze.” Faculty members stated that they used digital media and educational applications that supported the learning process, such as the Kahoot gaming application. One participant stated, “Activating gamification applications such as Kahoot is a good way to motivate students to focus while explaining groups and applying project-based learning methodologies and problem solving is an excellent way to activate modern teaching trends.”

Most faculty (59.8%) found online course teaching to be practical as an interactive mode of content delivery that engaged students in discussion and encouraged collaboration on various course tasks and assignments. Faculty actively participated in e-learning strategies, with one participant stating, “When I teach my courses as online instructions, resources such as video help

my students interact, discuss and ask questions.” Others responded, “ Online teaching activates collaborative learning” and, “Reading resources from previous work increases participation, interaction, and critical analysis,”

For instructions delivery, 4.1% of faculty found online teaching a difficult and time-consuming process as far as content preparation, locating relevant material, and preparing PPTs. One participant stated, “I find it difficult to update presentations.” Otherwise, faculty members faced the difficulty of Internet connection failure during the class time: “When preparing my courses as online instructions, I face the problem of Internet outage, as I postpone some of the instructions for other times.”

Qualitative Questions 1, 2, 3, 4, 5 (Section Four of the Instrument)

1- In your opinion, what are the perceived advantages, for you, of using online tools in your teaching practice?

Table 27

Description of Categories for Advantages Related to Online Teaching Tools

Categories	Description	Number and Percentage
No Use	There is no advantage to online teaching tools.	N= 17, 14.0 %
Flexibility	There is flexibility in scheduling asynchronous and synchronous instructions, with the option of rescheduling for another time. Faculty members and students have options to log in anywhere to instructions and students can benefit from recorded instructions, too.	N= 40, 31.7%

Easy and Fast	It is fast and easy to communicate with students, transfer documents, and save for future use that saves effort and time.	N= 30, 24.3%
Interactive with Modern Tools	It is interactive to invoke self-learning and motivate students to be responsible for their learning. It provides students with peer interaction and enhances collaborative learning.	N= 37, 30 %

Table 27 shows the advantages that faculty identified for using online teaching tools. 14.0% of faculty members did not identify any advantages associated with using online tools during COVID-19, with one participant stating, “I don't think there is a perceived advantage or benefit.”

However, 31.7% of faculty members found it to be a flexible mode of teaching, which could be scheduled anytime and anywhere with students benefiting from synchronous and asynchronous sessions: “The advantages are wonderful and suitable for a faculty member, such as simultaneous instructions, allowing them to be performed at the same time from anywhere.”

24.3% of faculty members found it to be an easy and fast way to communicate with students during and after class, share instruction material, provide feedback, and discuss course assignments. One participant stated, “It has proven its effectiveness in terms of student communication anywhere and time commitment.” Others responded, “Saving time and facilitating the delivery of information, as well as the availability of recorded instructions, so that the student can resort to them wherever he wants,” “Ease of setup and display,” and, “Save the information for the student to refer to it at any time.”

There were 30% of faculty members who found online digital tools to be interactive, motivating students to actively participate in discussion, engage in self-directed learning, and collaborate with peers simultaneously: “Flexibility in the use of tools and equipment by the faculty members and students.” On the other hand, 14.0% of faculty members saw no advantage to online teaching tools: “There are no advantages.”

2- In your opinion, what are the perceived disadvantages, for you, of using online teaching in your teaching practice?

Table 28

Description of Categories for Disadvantages of Online Teaching Tools

Categories	Description	Number and Percentage
No Disadvantage	There is no perceived disadvantage	N= 21.9 %
Technical and Connectivity Issues	Technical Issues such as system updates, Internet, and technology failures, and loss of information and files. Costly software and their updating some tools. Time-consuming system updates.	N= 4435.2 %
Lack of Face-to-face Interaction	There is no direct or face-to-face student or faculty members interaction, no eye contact, students can't be engaged and motivated in distance learning, not suitable for scientific-practical and lab work. Online assessment is not	N= 46, 37 %

	feasible and valid due to the absence of physical interaction.	
Costly and Complicated	Online instructional tools are costly specifically buying software, paying for subscriptions, cost of teaching material (digital devices), and high-speed Internet.	N= 32, 25.9 %

Table 28 shows the disadvantages of using online teaching at the university, and during the COVID-19 pandemic. According to 35.2% of faculty members, there were technical and connectivity issues such as continuous system updates and loss of information during data transfers: “Stress, devices always need updates and downloads, which makes me nervous a lot.” Another participant responded, “Suddenly there are problems that make me lose some of my documents.” Also, slower Internet connections caused class interruptions at many points. One participant stated, “I find it difficult to communicate sometimes, which forced me to communicate with the communication company every time to make the necessary repairs.”

37% of faculty members indicated that they missed face-to-face interaction and did not consider virtual instruction to be an equal alternative to in-person instruction: “Loss of physical interaction.” Another responded, “Do not make up for in-person instructions and lower learning outcomes.” They also indicated that virtual instruction was not suitable for practical and lab work in science subjects, and that online assessment was also not feasible: “The nature of the academic program in my clinical lab sciences, practical training is a must which CAN NOT BE DONE using the online tool.” Another responded, “Not suitable for all courses, especially scientific courses.”

Furthermore, 25.9% of faculty indicated that online instructional tools were costly, and that they had to pay for subscriptions, materials, digital devices, and high-speed Internet. One participant stated, “The cost of some tools and need high amounts.” Another responded, “The cost, the educational software tools have become very expensive.” There were 1.9 % of faculty who saw no disadvantages to online teaching tools: “There are no disadvantages.”

3- In your opinion, what are the perceived challenges, for you, of using online teaching and learning in your teaching practice?

Table 29

Description of Categories for Challenges Related to Online Teaching Tools

Categories	Description	Number and Percentage
No Challenge	There is no challenge	N= 5, 4.7%
Time Consuming and Complex	Lack of time to practice online teaching interactive tools, physical exertion, extra time to prepare and practice instructions, upload files, and locate content to present in the class, and waiting for system updates.	N= 48, 38.3%
Lack of Skills and Support	Digital tools are complicated and complex, and there is no support available from the university, Faculty members lack the necessary skills to prepare and deliver online instructions.	N= 18, 15%
Lack of Physical Interaction	There are no faculty members-students physical interaction. Students are not fully engaged in the learning process, and often communicating with students is difficult. Testing is	N= 15, 12.1%

	not reliable and practical work is not possible in online teaching.	
Connectivity	There is a connectivity problem that causes an interruption.	
and Cost	Costly high-speed Internet and computing devices such as laptops, computers, and other devices for online teaching. It includes purchasing software and buying subscriptions to online meeting tools.	N= 38, 29.9%

Table 29 shows that the majority of faculty members (38.3%) experienced significant challenges related to the time and complexity of handing virtual instruction. They found it a very complicated method that required extra practice and extensive time for class set up, preparing materials, PowerPoint presentations, and performing other activities before and after online sessions: “Time and effort in using online tools.” Other participants responded, “Time and effort training on new technology tools” and, “Effort and time, and sometimes you have to be connected to the Internet all the time and day.”

15% of faculty had little to no skills for using digital media in their instruction, and sought the help of their colleagues. They expressed the need for training related to using digital tools for their virtual classes, indicating that there was a, “Lack of knowledge of the course faculty members or students about the distance teaching process.” Another participant responded, “Effort to train on new technology tools for me and ask for help frequently.”

12.1% of faculty members experienced a lack of engagement from students, which was not appropriate for practical and lab work in science programs: “Engaging students.” Another participant responded, “Clinical and practical training of students.”

Another significant challenge (29.9%) found was connectivity and the cost of Internet access, materials, and devices. Faculty members had to buy high-speed Internet to resolve connectivity issues, which was a great concern for faculty members: “Many design programs are not paid by the university and are rather expensive, which makes me switch to less useful and free programs.” Other participants responded, “Internet connection is expensive” and, “Internet outage and high cost.” On the other hand, there were 4.7 % of faculty members who saw no challenges related to online teaching tools: “There are no challenges.”

4- In your opinion, what are the benefits, to you, of using online teaching tools for the preparation of instruction (e.g., communication tools, learning management systems (LMS) ...)?

Table 30

Description of Categories for Benefits Related to Preparation for Online Teaching

Categories	Description	Number and Percentage
No Benefit	There is no benefit to using online tools	N= 5, 4.6%
Fast and Flexible	It is a fast and flexible mode to prepare for instructions, and material is easily available, quickly downloaded, or uploaded for students' immediate use. The flexibility allows faculty members to change the content and use it anytime anywhere and even can save it for future use.	N= 16, 12.9%
Simple to Send Communication	The online instructional system is easy simple to use for faculty members. Faculty members can	N= 47, 37.6%

	communicate with their students via emails or text messages when needed and send prompt feedback.	
Synchronous and Asynchronous Instruction	It includes synchronous and asynchronous instructions, saved instructions and other material for future use, and interactive modes of instruction that require effort and time.	N= 56, 44.9%

Table 30 shows the benefits related to the use of online teaching tools in preparing online instruction. According to 44.9% of faculty members, virtual instructional practice can be delivered synchronously or asynchronously with the opportunity to save for future use and to allow faculty and students to remain interactive online instructions: “Synchronous instruction and quizzes quick preparation issuance of electronic certificates automatically recording synchronous instructions / seminars / courses ... etc.” Another participant responded, “Memorizing educational materials and using them in different classrooms.”

37.6% of faculty members found it to be a simple way to communicate. One participant stated, “Easy use of digital teaching resources.” Another responded, “Facilitate the educational process.”

The virtual instructional system was recognized as fast and flexible by 12.9% of faculty members, who were able to download and upload material quickly: “Ease of modification and the use of flexible learning tools.” Only 4.6% of faculty did not recognize any benefits of online teaching tools for the preparation of online teaching: “There is no.”

5- In your opinion, what are the benefits, to you, of using online teaching tools for the delivery of instruction (e.g., communication tools, learning management systems (LMS) ...)?

Table 31***Description of Categories for Benefits of Online Instructional Delivery***

Categories	Description	Number and Percentage
No benefit	There is no benefit	N= 4, 2.8%
Easy and Flexible	The digital interface for online learning is easy to use, simple and flexible in scheduling, and delivering online instructions.	N= 37, 30.2%
Interactive	It is interactive, which allows students to engage in constructive online discussion and self-learning at their own pace and convenience. The students like online instructions to some extent. It provides direct contact without face-to-face interaction.	N= 58, 46.2%
Synchronous Asynchronous	The online teaching process provides the opportunity for synchronous and asynchronous instructions, allowing students to revisit instructions and confirm the information discussed in the class. It allows learning and practicing new skills in using digital media (computer and software), saves time, and delivers the content at a faster rate.	N= 25, 20.7%

Table 31 showed that 30.2% of faculty members found this mode to be easy and flexible for delivering instruction, allowing for rescheduling and ease of delivery: "Flexibility and

enhance learning for students and break the routine." Another participant responded, "Change the atmosphere of attendance instructions and cut the routine." Additionally, the majority of faculty members (46.2%) found it to be an interactive way to communicate that promoted self-learning, student engagement, and peer collaboration: "Enhance learning through thinking and communication skills." Another responded, "Ease of communication with students."

20.7% of faculty members considered online instructional delivery useful for scheduling synchronously or asynchronously, communicating with students easily, and practicing new skills in using computers, various software, and digital content: "Students' interaction and desire for continuity of synchronous distance learning." Another participant responded, "Enhance discussion skills and enrich knowledge." Only 2.8% of faculty members found no benefits related to online instructional delivery, with one participant stating, "There is no."

Summary

In this chapter, the data has been analyzed in detail to answer the quantitative and qualitative research questions. In the first section, the data were analyzed for demographics at the three universities (AIU, KFU, BU) including gender, age, teaching experience, and the usage of online teaching tools. In the second section, the data were analyzed in relation to the quantitative research questions. Data were analyzed via the SPSS program using extraction frequency, means, standard division, and ANOVA. In the last section, data were analyzed to answer the qualitative questions. The qualitative analysis involved the identification of codes and themes that were developed prior to writing up the results.

CHAPTER 5

INTERPRETATION DATA AND DISCUSSION FINDING

Summary

This descriptive study was conducted to investigate the factors and challenges influencing faculty members' adoption of online teaching into teaching practice at Saudi universities. The study utilized a convergent parallel mixed methods design to collect both quantitative and qualitative data. Convergent parallel methods involve the concurrent collection of quantitative and qualitative data, and the researcher designed the instrument to be able to collect both at the same time. The questionnaire was sent to faculty members via email through the Deanship of Scientific Research at each of the three universities. The participants who completed the questionnaire totaled 124 from the three universities, with the most faculty members belonging to Imam Abdulrahman bin Faisal University (49), followed by King Faisal University (41), and the University of Bisha (34). Participants represented both male and female genders, as well as different colleges and departments from the three universities whether Saudi faculty members and non-Saudi faculty member. The quantitative data were analyzed via SPSS and ANOVA for frequency, means, and standard deviation. The qualitative data were analyzed using themes and codes after translation. This chapter presents multiple topics: a summary, the limitations of this descriptive study, the interpretation of quantitative and qualitative data results, discussion of the results, recommendations for future faculty members who would like to implement online teaching into their teaching practice, and recommendations for future study.

Research Hypothesis

H1: There are differences among the following variables: gender, age, academic rank, teaching experiences, department or college, nationality, type of contract availability of home technology

tools and connecting to the Internet at home, provision of a university office computer and connecting to the Internet at the university.

H2: Faculty members have differing levels of opportunity when using online teaching in the instructional process, such as access to the Internet when delivering or preparing online instruction from the university or from home.

H3: There are possible challenges that influence whether faculty members use online teaching tools in their teaching practice.

H4: There are positive advantages associated with using online tools for preparing instructional delivery.

Discussion of the Findings

For this study, the quantitative and qualitative research questions were focused on determining the factors and challenges influencing Saudi faculty members' adoption of online teaching into teaching practice at higher institutions. This study was conducted at three universities in Saudi Arabia: Imam Abdulrahman bin Faisal, King Faisal University, and University of Bisha. The results were compiled and analyzed in order to answer the research questions. This section presents a discussion of the research questions:

Research Question 1

1- What differences in Saudi faculty members' use of online tools can be associated with demographic variables such as gender, age, academic rank, teaching experiences, department or college, nationality, and type of contract, and technological variables such as possession of a home digital resource, provision of university digital resources, Internet access at a university, and Internet access at home?

To answer this, the researcher divided this question into two parts. The first part was analyzed via ANOVA in order to compare and determine the relationship of the variables to the faculty members to use of provided university resources in online teaching tools. Part two was analyzed to determine the relationship of the variables to the use of a personal digital resource at home in online teaching.

Based on the ANOVA for the first part of the analysis, there were no significant differences identified for gender, faculty members' academic rank and experience, nationality, and contract types in relation to the use of university-provided resources for online teaching tools. This finding is compatible with earlier studies from Saudi Arabia (Alenezi, 2017; Alsuhaymi, 2018; Alghamdi & Bayaga, 2016; Alharbi & Drew, 2014) which provided evidence that there were no differences between male and female groups who used eLearning at one of Saudi Arabia's institutions, that there were no significant differences among non-Saudi and Saudi faculty members in terms of using online teaching tools, and lastly that there were no significant differences among faculty members for using learning management system.

Although the first part of this analysis contradicted the research hypotheses, the second part of the analysis provided results that were consistent with the research hypotheses. Significant differences were found among faculty members based on age, university departments or colleges, and the experience levels of faculty members for using university provided resources for online teaching tools. The ANOVA analysis for this study indicated that there were significant differences across age groups (21-24 years). This finding is comparable to results from previous studies (Van DerKaay & Young, 2012; Aldojan, 2006) indicating that younger faculty members are more likely to use online teaching tools and technology tools in their teaching practices. Additionally, there were significant differences found between faculty

members at the Imam Abdulrahman bin Faisal University within the Arts and Social Sciences departments. These findings resemble those of previous studies (Al Tayeb, 2014; Ahmed et al., 2016). There were significant differences found for using personal Internet and online teaching tools based on department and specialization. Lastly, the findings indicated that there were significant differences between faculty members with 5-9 years, 15-19 years, and 20-24 years of teaching experience. This was consistent with an earlier study (Al Meajel, 2018) indicating that there were statistically significant differences in the acceptance and usage of personal online tools among faculty with less than or equal to 15 years of teaching experience.

In the second part of the ANOVA analysis, which involved comparisons of the variables, there were no significant differences found based on faculty members' age, university, academic rank or teaching experience level, or gender to use of a personal digital resource at home. These findings were similar to the results of other studies (Alshankity & Alshawi, 2008; Liu, 2010; Alharbi & Drew, 2014; Qudais et al., 2010) that indicated there were no significant differences among faculty members for using a personal computer or personal media ability and knowledge based on gender, age, academic rank, and teaching experiences.

The findings from the ANOVA analysis indicated that there were significant differences found for faculty and using personal digital resources. The differences were found between the three different university contract types. Specifically, faculty with non-renewable contracts were found to use personal online teaching resources more than those with renewable contracts. These findings were similar to the results of another study (Alghamdi & Bayaga, 2016), which reported significant differences in LMS usage. Faculty members in long-time contract positions were reported to use LMS more than those in short-term contract positions. Additionally, differences were also found based on nationality, in that Saudi faculty use personal online teaching resources

significantly more. These results contradicted findings from another study (Alsuhaymi, 2018), which reported that there were no significant differences based on faculty nationality related to using online teaching tools (social media) in their teaching practice.

Online Teaching Tools for Instruction Preparation and Delivery.

The results demonstrated that the use of university-provided computers and digital devices varied across the three universities, and that a significantly higher number of faculty members used university-provided desktop and laptop computers with minor variations (Imam Abdulrahman bin Faisal University, King Faisal University, and the University of Bisha). The use of university-provided cell phones and tablets was very limited, and these technologies were least commonly used for instructional preparation among faculty members at all three universities.

The use of personal computers and laptops was also frequent among university faculty members and was found to be at a similar level to the use of university-provided devices with slight variations across the three universities. The use of personal cell phones and tablets was frequent relative to university-provided devices for instructional preparation, and the use of personal cell phones and tablets was similar at all three universities.

For instructional delivery, the use of university-provided desktops was more frequent than the use of laptops, which were the second most common device. Similarly, cell phone use to deliver instruction was very limited among all three universities, and only a few faculty members indicated the use of university-provided cell phones for instructional delivery. The use of personal tablets in delivering instruction was moderately low but varied across the three universities; it was least common in Imam Abdulrahman bin Faisal University compared to the other two universities. The use of personal computing devices for instructional delivery varied

across the universities, and desktop use was frequently followed by laptops. The use of personal cell phones and tablets for instructional delivery was relatively higher than university-provided devices. Finally, university faculty members utilized university-provided desktop computers and laptops more frequently than personal devices. However, they used their cell phones and tablets more than university-provided devices for instructional preparation and delivery.

Use of Personal and University-Provided Internet Tools.

The results indicated that faculty members used university-provided and personal Internet for instructional preparation and delivery almost equally, regardless of minor differences across the three universities. There was significant use of university-provided Internet, including DSL and WIFI, for the purpose of instructional preparation and delivery. Similarly, the use of personal WIFI and cell phone data were also used equally to prepare and deliver instruction. Finally, there were no differences found in the use of personal and university-provided Internet for instructional preparation and delivery.

Research Questions 2 and 3

2- What are the perceived opportunities for faculty members using online teaching in the instructional process?

3- How do faculty members rate the perceived challenges associated with using online teaching in the instructional process?

To answer these two research questions, the findings are presented in an interpretation section to merge the results for questions 1 and 2.

Interpretation of Quantitative and Qualitative Data.

The results from the quantitative and qualitative parts of the study were congruent and supported each other. Comparisons were drawn between the quantitative and qualitative data in

order to further interpret the results. For this interpretation, the researcher chose a joint display (Table 31) for the mixed data in order to better organize the mixed methods findings (Fetters, 2020). The merging of quantitative and qualitative findings side-by-side enables the researcher to gain a new perspective on the results of a mixed methods study (Guetterman et al., 2015). This was specifically used to address research questions 2 and 3.

Table 32

Comparison of Quantitative and Qualitative of Use of Online Teaching Tools

Potential Challenge/Experience	Quantitative	Qualitative			
	Use of Online Teaching Tools (*Agree %)	Advantages	Disadvantages	Challenges	Benefits
Actual Use	*62.5 %	Easy and Fast	Technical and	Time-consuming	Easy and simple use
Ease (Ease of Use)	*61.3%	(24.3%)	connectivity issues	and complex	(37.6%)
			(35.2%)	(38.3%)	
Perceived Usefulness	*59.4%	Flexibility	Costly and	Connectivity and	Fast and flexible
		(31.7%)	complicated	cost (29.9%)	(12.9%)
			(25.9%)		
Compatibility	*60.9%	Interactive with	Lack of Face-to-	Lack of	Synchronous and
Facilitating Resources	*62.9%	modern tools	face interaction (37	Interaction	Asynchronous
		(30%)	%)	(12.1%)	instructions (44.9%)
Perceived Behavioral Control	*62.1%			Lack of Skills and	
Self-efficacy	*58.1%			Support (15%)	

Quantitative results indicated that faculty members from all three universities utilized online digital tools such as an LMS for communicating with students. The major reasons for using the online instructional process were ease of use, the usefulness of various online digital media for preparing and delivering instruction, perceived compatibility with instructional tools, facilitation in online teaching, and the ability to use digital tools. The results indicated an overall high satisfaction level with using online digital tools for instructional delivery.

From the quantitative data, equivalent categories such as actual use, ease of use, perceived usefulness, compatibility, facilitating resources, perceived behavioral control, and self-efficacy were identified and matched with qualitative themes/categories as shown in Table 32. The results indicated a similar level of usage for online and digital teaching tools in the online teaching process and are summarized here.

Quantitative results showed that most faculty members indicated agreement towards using online and digital teaching tools for actual use (62.5%) and because of the ease of use (61.3%). These results were parallel to the qualitative categories indicating that online and digital teaching tools were easy and fast (24.3%), easy and simple to use (37.6%), and simple to communicate (30.2%) as benefits. However, faculty also indicated that there were disadvantages and challenges such as technical and connectivity issues (35.2%), or that online and digital teaching tools could be time-consuming and complex (38.3%).

Similarly, perceived usefulness (59.4%) was compared with the factors of flexibility (31.7%), cost and complexity (25.9%), connectivity and cost (29.9%), and fast and flexibility (12.9%). These results indicated that high perceived usefulness was related to the concepts of flexibility and fast communication, whereas possible disadvantages and challenges were cost, complexity, and connectivity.

Two quantitative concepts, compatibility (60.9%) and facilitating resources (62.9%), were interpreted as equivalent to interactivity with modern tools (30%), synchronous and asynchronous instruction (44.9%), and interactivity through synchronous and asynchronous delivery (44.9%). However, the disadvantages and challenges included a lack of face-to-face interaction (37%) and a lack of interaction (12.1%).

The last two quantitative concepts of perceived behavioral control (62.1%) and self-efficacy (58.1%) were compared with skills. It was found that 15% of faculty members reported a lack of skills and support as a significant challenge in using online teaching tools.

The findings revealed that faculty members identified several advantages of using online tools, including the flexible schedule of synchronous and asynchronous instructional delivery (31.7%), ease of use (24.3%), and interactive modes of content delivery for collaborative learning (30%). Similarly, the benefits of online teaching experiences included quick and flexible instructional delivery (12.9%), simplicity and usefulness (37.6%), and the feature of synchronous vs. asynchronous instructional delivery (44.9%) with flexibility of time and schedule.

Qualitative results revealed that the major disadvantages of online learning tools were technical issues, Internet connectivity problems, and the high costs associated with buying software. On the quantitative side, securing Internet access consistent with the use of university-provided computers, laptops, and other devices for instructional preparation and delivery was found to be a disadvantage of using online teaching tools.

The only disadvantage found for the online teaching process was a lack of face-to-face interaction (37%). This was similar to a challenge found i.e., lack of physical interaction (12.1%) that was not supported by quantitative findings. Other challenges associated with the online teaching process were found, such as time consumption and the complexity of handling digital

tools (38.3%), lack of skills to operate (i.e., self-efficacy), lack of technical support available to faculty members (15%), and cost and connectivity issues (29.9%).

The last qualitative question was related to the perceived benefits of utilizing online teaching tools. Results were similar to prior findings indicating that usefulness and ease of use (30.2%), interactivity (46.2%), and the flexibility to deliver synchronously or asynchronously (20.7%) were benefits. The quantitative and qualitative data supported that online and digital tools were easy to use, fast, interactive, effective, and delivered quality online instruction to students through both the asynchronous and synchronous modes of instructional delivery. However, the major challenges found were technical issues and connectivity problems, lack of face-to-face interaction, the cost of buying tools such as programs, devices, and Internet data, and a lack of skills required to operate digital and online teaching tools.

The DTPB was based on the previously developed The Planned Behavior (TPB) model by Ajzen in 1991, which was designed to explore the control factors, social, and institutional that influence technology usage. The Decomposed Theory of Planned Behavior (DTPB) explains that the behavior of individuals is influenced by their intentions, attitudes, and beliefs. The model has three components that explain individual actions: attitude, subjective norms, and perceived behavioral control (Herrero et al., 2008). Human actions are influenced by their behavioral intentions such as the influence of peers, superiors, and students with positive and negative attitudes. These attitudes may include things such as perceived usefulness, ease of use, and compatibility, and can strengthen behavior and perceived outcomes.

Attitude.

In the present study, the quantitative and qualitative results indicated that faculty members' engagement or use of online teaching tools in their teaching practices were greatly

affected by their attitudes and perceived usefulness (Mouloudj et al., 2021; Al-Taamneh, 2011). Faculty members indicated that their choices to engage with online teaching tools were greatly influenced by the perceived usefulness of online teaching during COVID-19. This was related to their flexible and interactive nature. Additionally, the quantitative findings showed that the perceived usefulness was significantly impacted by faculty attitudes. For example, 78.3% of faculty members felt that using online tools would be helpful for their students, and 79.9% felt that online tools would improve students' satisfaction (See Table 23). The results are consistent with prior studies (Yao et al., 2022) indicating that the amount of effort an individual put into an activity is measured through their behavioral intentions. Several factors can contribute to the positive attitudes of faculty members toward online teaching tools. Specifically, behavioral and control beliefs are significant factors that influence attitudes (Mouloudj et al., 2021; Tagoe & Abakah, 2014).

Subjective Norms.

The qualitative findings from this study revealed the individual intentions of faculty in terms of selecting online and digital tools for online instruction. This was based on their assessments of expected difficulty towards the outcomes of intended behavior (Yao et al., 2022). For example, faculty members indicated that they used online teaching tools because such tools were easy to operate and provided ample opportunity to interact with several students at the same time. However, faculty members also indicated perceived difficulty and complexity associated with online digital tools. On the other hand, quantitative findings indicated that peer influence, student influence, and superior influence were significant factors affecting faculty members' subjective norms. Similar findings have been previously reported (Hartshorne et al., 2010;

Alsuhaymi, 2018) in which faculty members' students, peers, and superiors have an apparent influence on their use of online teaching tools in teaching practice.

Perceived Behavioral Control.

The quantitative findings indicated the significance of facilitating conditions, technology, and resources as factors that affect faculty members' behavioral control over online teaching in this study. The findings are consistent with prior studies (Dermentzi et al., (2016); Alsuhaymi, 2018), and indicate that faculty members are more positive and convinced of their abilities to use online teaching tools in their teaching practices when provided with resources and technology.

The results from the qualitative section indicated that faculty members did experience some negative outcomes such as complexity, cost, connectivity, and lack of support in the teaching online instruction process. However, they continued their efforts. Studies (Yao et al., 2022; Davidovitch & Yavich, 2021) have shown that during COVID-19, most of the instructional processes shifted so that the online teaching process was the only acceptable and feasible way to keep students engaged while remaining at home. Faculty members had no alternative option available to continue teaching. Therefore, attitudes were significantly changed regardless of the positive or negative outcomes from using online teaching tools. The findings from this study indicated that faculty members were engaged in online teaching positively despite the difficulties and challenges. However, they perceived significant usefulness in utilizing various online and digital teaching tools.

Study Limitations

Identifying and recognizing the limitations is a very important step in research studies (Connelly, 2013). The importance of determining the limitations is to recommend how another

researcher might avoid and minimize similar limitations in the future (Connelly, 2013). The possible limitations for this descriptive study were identified as follows:

- 1- The survey for this descriptive study was conducted among faculty members who were working at three universities (IAU, KFU, and UB) in Saudi Arabia, while the number of Saudi universities is greater than 60 (See Literature Review Chapter). This study does not cover even 50% of the Saudi universities, and this study does not have external validity. External validity is related to generalizing the findings and, "refers to the ability to generalize findings across different settings" (Hoepfl, 1997, p. 59). Thus, the findings from this study cannot be generalized to all Saudi universities.
- 2- The participant sample for the study included faculty members from three universities in Saudi Arabia. The sample size from IAU was 49, KFS was 41, and UB was 34. However, the total number of faculty members at IAU is 3179, KFU is 1924, and UB is 1200 (see Literature Review Chapter). The survey was sent to all faculty members at each university via the Deanship of Scientific Research. This means that the percentage of faculty respondents from IAU was 1.541%, KFU was 2.131%, and UB was 3.25%, and that less than 5% of the total faculty members responded for each university. In future, a more sizeable sample may provide more effective and reliable results and data. More responses may provide new insights about the challenges and influences associated with using online teaching tools.
- 3- The language was one of the limitations in this descriptive study. "Researchers may have language issues and problems accessing the subjects from whom they would like to get data" (Connelly, 2013, p. 325). There was always a risk that, during the translation

process, the researcher might miss a word or miss the true meaning of the participants' responses.

- 4- The researcher was forced to collect the data in summer, which is a vacation period for faculty members at Saudi Universities. It was not easy to obtain ethical approval from several universities, each with a different policy in place for collecting data. Therefore, by the time that the procedures for collecting data were completed and approved for the different institutions, the data collection period occurred during the summer. This meant that the researcher was unable to gather a more significant number of responses. Thus, time may be considered one of the limitations of this descriptive study since it may have had an impact on decreasing the results (Theofanidis & Fountouki, 2018).

Recommendations for Faculty Members to Enhance the Use of Online Teaching Tools

Within Their Teaching Practices

Based on the significant findings from this descriptive study, here are some recommendations for faculty members who are considering the use of online teaching and digital tools at Saudi Arabian universities:

Preparing and Delivering Instruction

For preparing and delivering instruction, the findings from this study support the recommendation that faculty members use multimedia tools such as videos, graphical objects, PowerPoint (PPT) presentations, and mind maps to present course content. This study found that online teaching tools provide an easier way to communicate with students through sharing course materials, PPT slides, assignments, and research journal articles during and prior to the start of the semester, and before the commencement of class. Also, this study found that online teaching tools provide an easier way to contact and interact with students virtually through e-learning

strategies such as storing instructional materials for future use, using previously developed instruction with modifications, and using pre-developed PowerPoint slides for online instruction. This process also helped faculty members to use multiple interfaces such as online controlled electronic whiteboards, educational applications, and other digital gadgets. Daugherty and Funke (1998) recommend that online instruction via PPT can be made more interactive by allowing for immediate feedback and discussion during delivery.

Difficulties and Challenges

A significant finding from this study was that faculty members found digital resources and online teaching processes to be complex and difficult. Specifically, faculty members found online teaching processes to be time consuming relative to regular instructions and indicated that most of their time was consumed in locating relevant journal articles, books, PPT slides, and other supporting content. The study also found that faculty members felt incompetent when using digital tools for online teaching and highlighted their interest in acquiring training with more knowledge for synchronous or asynchronous courses. A previous study in Saudi Arabia showed that faculty members had positive attitudes toward using online tools to support the teaching and learning process (Aifan, 2015).

Perceived Usefulness

The findings from this study showed that perceived usefulness was significant, which provides opportunities to increase the integration of online teaching tools among faculty members working at Saudi Arabian universities with training courses. Previous findings showed that there was a powerful effect of perceived usefulness towards computer tools on training system quality and faculty experiences (Igbaria et al., 1995).

Subjective Norms

The findings from this study found that there were a significant number of subjective norms influenced by faculty peers, students, and superiors. These impacted faculty members to initiate discussions with others (department heads or peers with experience) about using online teaching tools. These findings were consistent with another study (Alashwal, 2019), which confirmed that discussion among peers assisted faculty with using online teaching tools.

University Motivation

According to the findings from this study, institutions are the key to inspiring faculty members to use online teaching tools in their teaching practices. This was consistent with other study findings (Orr et al., 2009). Therefore, there is evidence that supports the efforts of Saudi Arabian universities to motivate faculty members to use online teaching and digital tools through providing resources to majors, departments, and reducing the cost of resources and tools.

Recommendations for Future Study

This section suggests the following recommendations for future studies in this area. This study focused on the influences and challenges impacting faculty members using online teaching tools at three universities in Saudi Arabia with application of the DTPB theoretical framework. In this study, one section of the questionnaire was designed to conform to the theoretical framework in order for the findings to be more reliable. For future studies, the researcher recommends that the questionnaire design be more comprehensive in support of the convergent parallel mixed methods. This will allow future studies to be more comprehensive when considering the impacts of the decomposed factors theoretical framework on faculty behavioral intentions toward using online teaching and digital tools in their teaching practices.

This study was designed to examine faculty factors, influences, and challenges associated with using online teaching tools for three universities in Saudi Arabia. For future studies, the researcher suggests expanding the research sample size to the largest possible number of Saudi universities to allow for more generalization of research findings.

Oliver and McLoughlin (2001) verified that there were several teaching and technology tools that could encourage students, and that were used by faculty members throughout the teaching and learning process. When considering the wide variety of technologies and tools, each has strengths and weaknesses that differ when used within the teaching and learning process. Thus, the researcher recommends that future studies focus on specific, individual online tools for preparing and delivering instruction.

Some future research questions might be: What is the value of using online learning and digital tools for students? What are the effective online tools that are used by faculty for enhancing the learning process? What kind of online tools enhance critical thinking and higher thinking for students? These suggested research questions could apply to both undergraduate and graduate student populations.

Conclusion

This descriptive study determined the factors and challenges influencing faculty members to use online tools for teaching at three Saudi Arabian universities. Despite that online teaching and digital tools have been proven effective (Ghavifekr et al., 2016), there are still faculty members who face challenges and difficulties associated with using them. This study showed that there were faculty members who still exhibited lower levels in their use of online and digital tools in their teaching practices. The researcher has attempted to cover many of the factors that influence faculty members' use of online and digital teaching tools, however there are many

influences that require further examination in future studies implementing different methodologies. This study has proven that there were many faculty members who realized the importance of using online teaching and digital tools during the COVID-19 pandemic in particular, which has made them interested in using it currently. In conclusion, the researcher hopes that the findings from this descriptive study can inspire and assist faculty members who work at Saudi Arabian universities to consider the effects of using online and digital tools in the academic context. This is in alignment with the Ministry of Education's Vision 2030. It is also important for those who set educational policies at Saudi Arabian universities to ensure that the faculty implementation of online teaching tools is effective. Policies should be set in place to encourage both faculty members and students to better understand and recognize the usefulness of these online teaching and learning tools.

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APPENDICES

Appendix A

Consent Form English Language



Principal Investigator: Monerah Alduwairej

IRB#22-099

Title of Study: Determining Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabian Universities.

You are invited to participate in a research study. This form includes information about the study and contact information if you have any questions.

I am a doctoral student at Virginia Tech, and I am conducting this research as part of a complete Doctoral degree.

The purpose of this study is to examine “Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabian Universities”. This study is being conducted through Imam Abdulrahman bin Faisal University and King Faisal University in Saudi Arabia.

Your responses to the study questions will help identify challenges that might be (or have been) experienced by faculty attempting to adopt online teaching to their teaching practices.

Participants of this study should be faculty male or female who is currently faculty at Imam Abdulrahman bin Faisal University and King Faisal University either Saudi or non-Saudi.

If you decide to participate in this study, you will complete a survey. As part of the study, you will ask about some personal experiences you might have encountered as you attempted to use

online teaching. This survey includes fourth sections and the following different questions options and written.

The study should take approximately from 20 to 25 minutes of your time. This study has no more risks than are found in everyday life. You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and remain in the study. The investigator may withdraw you from this research if circumstances arise that warrant doing so. The investigator will do the best to protect the confidentiality of the information gathered from you, but we cannot guarantee 100% confidentiality.

Your responses are anonymous, so no one can associate your answers back to you. Please do not include your name or other identifying information in your responses that can identify you.

Any data collected during this research study will be kept confidential by the researcher.

Researcher will code the transcripts of the written questions without using any names. The survey will be uploaded to a secure password-protected computer in the researcher's office. The researcher will maintain a list that includes a key to the code. The master key of the survey will be stored for 3 years after the study has been completed and then destroyed.

If you have any questions or concerns about the research, please feel free to contact the investigator Monerah Alduwairaj at 440-502-7915, email (monerah@vt.edu) OR the advisor Dr. Kenneth Potter at 540-231-7039, email (kpotter@vt.edu). You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questions regarding your rights as a research participant, contact the Virginia Tech HRPP Office at 540-231-3732 (irb@vt.edu).

If applicable: If you would like to participate in this survey, click Start to begin or  to exit.

Appendix B

Survey English Language

Section 1:

Gender:

- Male
- Female

Age:

- 21- 24 years
- 25-30 years
- 31-40 years
- 41-45 years
- 46-50 years
- 51-55 years
- 56 years and above

Academic Rank:

- Teaching assistant
- Lecturer
- Assistant professor
- Associate professor
- Professor

Teaching Experience in Higher Education:

- less than 5 years
- 5 - 9 years
- 10 - 14 years
- 15 - 19 years
- 20 - 24 years
- More than 24 years

Current College/University:

Current Department:

Nationality:

- Saudi Faculty
- Non- Saudi Faculty

Type of contract:

- Nonrenewable contract
- Renewable contract (5 years and less)

Section 2: What Technologies Do You Use Most with Online Teaching?

	Never	Seldom	Moderate	Mostly	Always
1- What technology tools do you use most when preparing your online instruction?					
University provided desktop computer					
Personal desktop computer					
University provided laptop					
Personal Laptop					
University provided mobile phone					
Personal Mobile Phone					
University provided Tablet					
Personal Tablet					
2- What technology tools do you use most when delivering your online instruction?					
University provided desktop computer					
Personal desktop computer					
University provided laptop					
Personal Laptop					
University provided mobile phone					
Personal Mobile Phone					
University provided Tablet					
Personal Tablet					
3- If you want to access the Internet when preparing your online instruction. which of the following options are available to you?					
University server					
University wi-fi					
Home wi-fi					
Mobile phone					
4- If you want to access the Internet when delivering your online instruction. which of the following options are available to you?					
University server					
University wi-fi					
Home wi-fi					
Mobile phone					

2- What experiences have you had when **preparing** for teaching online courses? (For example: When preparing presentations for my upcoming classes, I often search for relevant images to use as part of my instruction. I have learned it frequently takes a very long time to locate useful images on the Internet and to download the images after I find them. Another lesson I learned when preparing for teaching online courses is how important it is to organize my saved files so I can easily find them when they are needed.)

Please share multiple examples if possible.

3- What online teaching experiences have you had when **delivering** online instruction in online courses? (For example: I can tell from the questions my students ask that the images I share when delivering my online instruction are serving a very useful purpose.)

Please share multiple examples if possible.

Section 3: The Use of Online Teaching and Learning Tools

	Strongly Agree	Agree	Disagree	Strongly Disagree	I don't Know
Actual usage					
AU1 I believe that I can communicate to my students about how to use online tools (e.g., communication tools, learning management systems (LMS) ...) in the classroom.					
AU2 I would have no difficulty explaining why online tools (e.g., communication tools, learning management systems (LMS) ...) may or may not be beneficial.					
Behavioral intention					
INT1 I will continue to use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					

INT2 I will use online tools (e.g., communication tools, learning management systems (LMS) ...) within the next semester.					
INT3 I will develop my skills with the use of online tools (e.g., communication tools, learning management systems (LMS) ...).					
Attitude					
ATT1 Online tools (e.g., communication tools, learning management systems (LMS) ...) are useful in my teaching practice.					
ATT2 The advantages of using online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice outweigh the disadvantages of not using them.					
ATT3 Using online tools (e.g., communication tools, learning management systems (LMS) ...) is a good idea.					
Ease of use					
EU1 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) is easy.					
EU2 I feel that the use of online tools (e.g., communication tools, learning management systems (LMS) ...) will be easy to incorporate into my teaching practice.					
Perceived usefulness					
PU1 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will help my students learn more about the subject.					
PU2 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will assist in improving students' satisfaction with the course					
PU3 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will assist in improving students grades.					

PU4 I feel that using online tools (e.g., communication tools, learning management systems (LMS) ...) will assist in improving students' evaluations of the course.					
PU5 To help my students better learn the material, I will incorporate online tools (e.g., communication tools, learning management systems (LMS) ...) in the course.					
Subjective norms					
SN1 My peers are using online tools (e.g., communication tools, learning management systems (LMS) ...) in their teaching practice.					
SN2 My superior confirms my ability and knowledge to use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
SN3 My peers think I will benefit from using online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
SN4 My superior thinks it is important that I use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
SN5 My students think it is important that I use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
Perceived behavioral control					
PBC1 Using the online tools (e.g., communication tools, learning management systems (LMS) ...) is entirely within my control.					
PBC2 I have the knowledge and ability to use online tools (e.g., communication tools, learning management systems (LMS) ...).					
Peer influence					
PI1 Peers who influence my behavior believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					

PI2 Peers who are important to me believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
Superior influence					
SUI1 My Superior, who influences my behavior, believes that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
SUI1 My superior, whom I report to, believes that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
Student influence					
SI1 Students, who influence my behavior, believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
SI2 Students, who are important to me, believe that I should use online tools (e.g., communication tools, learning management systems (LMS) ...) in my teaching practice.					
Compatibility					
Comp1 Using online tools (e.g., communication tools, learning management systems (LMS) ...) is compatible with the way I teach.					
Comp2 Using online tools (e.g., communication tools, learning management systems (LMS) ...) fits well with the way I teach.					
Facilitating conditions technology and resources					
FC1 The online tools (e.g., communication tools, learning management systems (LMS) ...) are compatible with the computer that I am already using in my teaching practice.					
FC2 I can use online tools (e.g., communication tools, learning management systems (LMS) ...) when I use any computer connected to the Internet.					
Self-efficacy					

SE1 I would feel comfortable using online tools (e.g., communication tools, learning management systems (LMS) ...).					
SE2 I could easily use online tools (e.g., communication tools, learning management systems (LMS) ...) on my own.					

Section 4: Utilization of online tools:

1- In your opinion, what are the perceived **advantages, for you,** of using online tools in your teaching practice?

2- In your opinion, what are the perceived **disadvantages, for you,** of using online teaching in your teaching practice?

3- In your opinion, what are the perceived **challenges, for you,** of using online teaching and learning in your teaching practice?

4- In your opinion, what are the **benefits, to you,** of using online teaching tools for the **preparation of instruction** (e.g., communication tools, learning management systems (LMS) ...)?

5- In your opinion, what are the benefits, to you, of using online teaching tools for the **delivery of instruction** (e.g., communication tools, learning management systems (LMS) ...)?

Appendix C

Consent Form Arabic Language



اسم الباحثة: منيرة عبد الرحمن الدويرج

عنوان البحث: العوامل المحددة والتحديات التي تؤثر على أعضاء هيئة التدريس في تبني التعلم عن بعد في جامعات سعودية متعددة.

رقم موافقة أخلاقيات البحث العلمي في جامعة فرجينيا تك: IRB#22-099

تجري الباحثة دراسة علمية بعنوان العوامل المحددة، والتحديات التي تؤثر على أعضاء هيئة التدريس في تبني التعلم عن بعد في جامعات سعودية متعددة؛ وذلك استكمالاً لمتطلبات نيل درجة الدكتوراه في تخصص تصميم وتقنيات التعليم من جامعة فرجينيا تك.

الغرض من هذه الدراسة البحثية: هو تحديد العوامل والتحديات التي تؤثر على أعضاء هيئة التدريس في تبني التعلم عن بعد في جامعات سعودية متعددة.

وستساعد إجاباتك على الأسئلة في تحديد العوامل والتحديات التي قد يواجهها (أو يتعرض لها) أعضاء هيئة التدريس الذين يحاولون تبني التدريس عن بعد في طرقهم التدريسية. وقد يكون المشاركون في هذه الدراسة البحثية من أعضاء هيئة التدريس من الذكور أو الإناث، الذين هم حالياً أعضاء هيئة التدريس في جامعتي الإمام عبد الرحمن بن فيصل والملك فيصل، سواء أكانوا سعوديين أم غير سعوديين. وإذا قررت المشاركة في هذه الدراسة، فستكمل الاستبانة كجزء من الدراسة، سوف تسأل عن بعض التجارب الشخصية التي قد تكون واجهتها في أثناء محاولتك استخدام التدريس عن بعد (اون لاین). هذا الاستطلاع يشمل أربعة أقسام، والأسئلة التالية بخيارات مختلفة ومكتوبة.

قد تستغرق الإجابة على هذه الدراسة ما يقارب ٢٠ إلى ٢٥ دقيقة من وقتك، والباحثة لا تتوقع وقوع أي أخطار عليك عند الإجابة على هذه الدراسة.

يمكنك اختيار ما إذا كنت تريد المشاركة في هذه الدراسة أم لا. وإذا تطوعت للمشاركة في هذه الدراسة، فيمكنك الانسحاب في أي وقت دون عواقب من أي نوع. كما يمكنك أيضًا رفض الإجابة على أي سؤال لا تريد الإجابة عليه والبقاء في الدراسة. وقد تستبعدك الباحثة من هذا البحث إذا ظهرت ظروف تستدعي القيام بذلك.

ستبذل الباحثة قصارى جهدها لحماية سرية المعلومات التي يتم جمعها منك، لكن لا يمكننا ضمان السرية بنسبة 100٪. ردودك مجهولة؛ لذلك لا يمكن لأحد ربط إجاباتك بك. يرجى عدم تضمين اسمك أو أي معلومات تعريفية أخرى في ردودك التي يمكن أن تحدد هويتك. سيتم الاحتفاظ بسرية أي بيانات يتم جمعها خلال هذه الدراسة البحثية من قبل الباحث. وسيقوم الباحث بترميز نصوص الأسئلة المكتوبة دون استخدام أي أسماء. كما سيتم تحميل الاستطلاع على جهاز حاسوب آمن محمي بكلمة مرور في مكتب الباحث. وسيحتفظ الباحث بقائمة تتضمن مفتاحًا للرمز، كما سيتم تخزين المفتاح الرئيسي للمسح لمدة 3 سنوات بعد اكتمال الدراسة ثم إتلافه.

إذا كان لديك أي أسئلة أو مخاوف بشأن البحث، فلا تتردد في الاتصال بالباحثة منيرة الدويرج على الرقم ٤٤٠٥٠٢٧٩١٥

والبريد monerah@vt.edu، أو المشرف الدكتور: كينث بوتنر على الرقم ٥٤٠٢٣١٧٠٣٩، والبريد الإلكتروني

kpotter@vt.edu

وأنت لا تتنازل عن أي مطالبات أو حقوق أو تعويضات قانونية بسبب مشاركتك في هذه الدراسة البحثية. إذا كانت لديك أسئلة

بخصوص حقوقك كمشارك في البحث تواصل بمكتب الاتش ار بي بي في جامعة فرجينيا تك على الرقم ٥٤٠٢٣١٣٧٣٢

والبريد الإلكتروني irb@vt.edu

Appendix D

Survey Arabic Language

القسم ١

الجنس:

- ذكر
○ أنثى

العمر:

- ٢١ - ٢٤ عاما
○ ٢٥ - ٣٠ عاما
○ ٣١ - ٤٠ عاما
○ ٤١ - ٤٥ عاما
○ ٤٦ - ٥٠ عاما
○ ٥١ - ٥٥ عاما
○ أكبر من ٥٦ عاما

الرتبة الأكاديمية:

- معيد
○ محاضر
○ أستاذ مساعد
○ أستاذ مشارك
○ أستاذ
○ أخرى

خبرة التدريس في التعليم العالي:

- أقل من ٥ سنوات
○ ٦-٩ سنوات
○ ١٠-١٤ سنة
○ ١٥-١٩ سنة
○ ٢٠-٢٤ سنة
○ أكثر من ٢٤ سنة

الكلية / الجامعة الحالية:

القسم الحالي:

الجنسية:

- عضو هيئة تدريس سعودي
○ عضو هيئة تدريس غير سعودي

نوع العقد:

- عقد غير قابل للتجديد
- عقد قابل للتجديد (٥ سنوات وأقل)

القسم ٢: ما هي أكثر التقنيات التي تستخدمها في التدريس عن بعد:

دائما	في الغالب	متوسط	نادرا	أبدا	
١- ما هي أكثر الأدوات التكنولوجية التي تستخدمها عند تحضير مقرراتك التي تقدمها عن بعد (اونلاين)؟					
					حاسوب مكتبي متوفر من قبل الجامعة
					حاسوب مكتبي شخصي
					حاسوب محمول متوفر من قبل الجامعة
					حاسوب محمول شخصي
					هاتف محمول متوفر من قبل الجامعة
					هاتف محمول شخصي
					جهاز لوحي (تابليت) متوفر من قبل الجامعة
					جهاز لوحي (تابليت)
٢- ما هي أكثر الأدوات التكنولوجية التي تستخدمها عند تدريس مقرراتك التي تقدمها عن بعد (اونلاين)؟					
					حاسوب مكتبي متوفر من قبل الجامعة
					حاسوب مكتبي شخصي
					حاسوب محمول متوفر من قبل الجامعة
					حاسوب محمول شخصي
					هاتف محمول متوفر من قبل الجامعة
					هاتف محمول شخصي
					جهاز لوحي (تابليت) متوفر من قبل الجامعة
					هاتف محمول متوفر من قبل الجامعة
٣- عندما ترغب في الاتصال بالإنترنت عند تحضير محاضراتك عن بعد، أي من الخيارات التالية متاحة لك؟					
					خادم (سيرفر) خاص بالجامعة
					شبكة واي فاي (انترنت لاسلكي) توفرها الجامعة
					شبكة واي فاي (انترنت لاسلكي) منزلية
					هاتف محمول
٤- عندما ترغب في الاتصال بالإنترنت عند تدريس محاضراتك عن بعد، أي من الخيارات التالية متاحة لك؟					
					خادم (سيرفر) خاص بالجامعة
					شبكة واي فاي (انترنت لاسلكي) توفرها الجامعة
					شبكة واي فاي (انترنت لاسلكي) منزلية
					هاتف محمول

٢- من خلال تجربتك في تدريس مقرراتك عن بعد (اونلاين) تحدث عن العوامل التي تواجهك عندما تقوم **بتحضير** مقرراتك الدراسية التي تقوم بتدريسها عن بعد(اونلاين)؟ "على سبيل المثال: عندما اقوم بتحضير عروض الباوربوينت التقديمية للمقررات التي أقوم بتدريسها، غالبا ما أبحث عن الصور ذات الصلة بمحتوى المحاضرة التي أقوم بتدريسها. لقد تعلمت أن ذلك يأخذ وقتا طويلا لتحديد الصور وتحميلها بعد العثور عليها. أيضا تعلمت درسا اخرًا عند تحضير المقررات عن بعد (اونلاين) وهو أهمية تنظيم، وترتيب مجلداتي، وملفاتي حتى أتمكن من العثور عليها بسهولة". (يمكن مشاركتك في هذا السؤال بأكثر من مثال).

٣- من خلال تجربتك في تدريس مقرراتك عن بعد (اونلاين) تحدث عن العوامل التي تواجهك عندما تقوم **بتدريس** مقرراتك الدراسية التي تقوم بتدريسها عن بعد (اونلاين)؟ "على سبيل المثال: يمكنني القول: إن الصور التي أشاركها في عروض الباوربوينت التقديمية في محاضراتي تساعد طلابي على طرح الأسئلة، وهي مفيدة للغاية (يرجى مشاركة عدة أمثلة إن أمكن)

القسم 3: استخدام أدوات التدريس عن بعد:

لا أعرف	أرفض بشدة	لا اوافق	أوافق	أوافق بشدة	
الاستخدام الذاتي					
					(١) أعتقد أنه يمكنني التواصل مع طلابي حول كيفية استخدام الأدوات عبر الإنترنت (على سبيل المثال، أدوات الاتصال، وأنظمة إدارة التعلم (LMS) ...) في الفصل الدراسي.
					(٢) لا يوجد لدي صعوبة في شرح لماذا أدوات التدريس عن بعد (اونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) قد تكون مفيدة أو لا تكون مفيدة.
النية السلوكية					

					(ن س ١) سأستمر في استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... في طريقي التدريسية.
					(ن س ٢) سأسخدم أدوات عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... خلال الفصل الدراسي التالي.
					(ن س ٣) سوف أقوم بتطوير مهاراتي التدريسية باستخدام الأدوات عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...).
الموقف					
					(م ق ١) تعتبر ادوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... مفيدة في طريقي التدريسية.
					(م ق ٢) مزايا استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... في طريقي التدريسية تفوق مساوى عدم استخدامها.
					(م ق ٣) يعد استخدام الأدوات عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... فكرة جيدة.
سهولة الاستخدام					

					(س أ ١) أشعر أن استخدام الأدوات عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... أمر سهل.
					(س أ ٢) أشعر أن استخدام الأدوات عن بعد (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... سيكون من السهل دمجها في طريقي التدريسية.
الفائدة المتصورة					
					(ت ف ١) أشعر أن استخدام الأدوات عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... ستساعد طلابي على تعلم المزيد حول هذا الموضوع.
					(ت ف ٢) أشعر أن استخدام الأدوات عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... ستساعد في تحسين رضا الطلاب عن المقرر.
					(ت ف ٣) أشعر أن استخدام أدوات التدريس عن بعد (اونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... ستساعد في تحسين درجات طلابي.
					(ت ف ٤) أشعر أن استخدام الأدوات عبر الإنترنت (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... ستساعد في تحسين تقييمات الطلاب للمقرر.

					(ت ف ٥) لمساعدة طلابي على تعلم المقرر بشكل أفضل، سوف أدمج أدوات التدريس عن بعد (أونلاين) (مثل أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) في مقرراتي التدريسية.
المعايير الشخصية					
					(م ش ١) يستخدم زملائي أعضاء هيئة التدريس أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) في طرقهم التدريسية.
					(م ش ٢) يؤكد رئيسي على قدراتي ومعرفتي في استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) في طريقي التدريسية.
					(م ش ٣) يعتقد زملائي أعضاء هيئة التدريس أنني سأستفيد من استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) في طريقي التدريسية.
					(م ش ٤) يعتقد رئيسي أنه من المهم أن أستخدم أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) في طريقي التدريسية.
					(م ش ٥) يعتقد طلابي أنه من المهم استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات

					الاتصال وأنظمة إدارة التعلم (LMS) ... في طريقتي التدريسية.
التحكم السلوكي المتصور					
					(ت س م ١) لدي القدرة على السيطرة الكاملة على أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... عند استخدامها.
					(ت س م ٢) لدي القدرة والمعرفة على استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...).
تأثير الاقران					
					(ت ق ١) يعتقد زملائي من أعضاء هيئة التدريس الذين يوثرون في سلوكي أنه يجب عليّ استخدام أدوات التدريس عن بعد (أونلاين) (مثل أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... في طريقتي التدريسية.
					(ت ق ٢) يعتقد زملائي من أعضاء هيئة التدريس المهمون بالنسبة لي أنه يجب عليّ استخدام أدوات التدريس عن بعد (أونلاين) (مثل أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... في طريقتي التدريسية.
تأثير الرئيس					
					(ت ر ١) يعتقد رئيسي الذي يؤثر في سلوكي أنه يجب عليّ استخدام التدريس عن بعد (أونلاين) (على سبيل

					المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) (... في طريقي التدريسية.
					(ت ر ٢) يعتقد رئيسي الذي أتبع تعليماته أنه يجب عليّ استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) (... في طريقي التدريسية.
تأثير طلابي					
					(ت ط ١) يعتقدون طلابي الذين يؤثرون في سلوكي، أنه يجب عليّ استخدام أدوات التدريس عن بعد (أونلاين) (مثل أدوات الاتصال وأنظمة إدارة التعلم (LMS) (... في طريقي التدريسية.
					(ت ط ٢) يعتقد طلابي المهمون بالنسبة لي أنه يجب عليّ استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) (... في طريقي التدريسية.
التوافق					
					(ت و ١) استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) (... متوافقة مع طرق تدريسي.
					(ت و ٢) استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) (... تتناسب تمامًا مع طرق تدريسي.
تمكين شروط أدوات التدريس التكنولوجية والمصادر التعليمية					

					(ت م ت ١) أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... متوافقة مع الحاسوب الذي أستخدمه بالفعل في طريقي التدريسية.
					(ت م ت ٢) يمكنني استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ... عند استخدام أي جهاز حاسوب متصل بالإنترنت في الجامعة.
الكفاءة الذاتية					
					(ك ذ ١) أشعر بالراحة عند استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...).
					(ك ذ ٢) يمكنني بسهولة استخدام أدوات التدريس عن بعد (أونلاين) (على سبيل المثال، أدوات الاتصال وأنظمة إدارة التعلم (LMS) ...) بمفردي.

القسم 4: استخدام الأدوات عبر الإنترنت:

١- برأيك، ما هي المزايا التي تعتقد أنها مناسبة لاستخدام الأدوات عن بعد (اونلاين) في اسلوب التدريس الخاص بك؟

٢- برأيك، ما هي أوجه القصور / العيوب التي تعتقد انها موجودة أدوات التدريس عن بعد (أونلاين) عند استخدامها في عملية التعلم؟

٣- برأيك، ما هي التحديات التي تواجهك عند استخدام أدوات التدريس عن بعد (أونلاين) في عملية التعلم؟

٤- برأيك، ما هي الفوائد والمزايا في استخدام أدوات التدريس عن بعد (أونلاين) عند تحضير مقرراتك الدراسية التي تقدمها عن بعد؟

٥- برأيك، ما هي الفوائد والمزايا في استخدام أدوات التدريس عن بعد (أونلاين) عند تدريس مقرراتك الدراسية التي تقدمها عن بعد؟

Appendix E

English Email to Faculty Members

Dear faculty member,

My name is Monerah Alduwairaj, and I am doctoral student at Virginia Tech in Instructional Design and Technology department. I was granted IRB approval for this Virginia Tech research study (IRB #22-099). I invite you to participate in my research study “**Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabian Universities**”. This study is being conducted through Imam Abdulrahman bin Faisal University, King Faisal University, and University of Bishah in Saudi Arabia. Your responses to the research study questions will help identify challenges that might be (or have been) experienced by faculty attempting to adopt online teaching to their teaching practices.

If you decide to participate in this research study, you will complete a survey. As part of the research study, you will ask about some personal experiences you might have encountered as you attempted to use online teaching. This survey includes four sections and the following different questions optional and written.

The research study survey should take approximately 20 to 25 minutes of your time. You will access the link of the survey when you click on the link for English Language (<https://virginiatech.questionpro.com/t/AU3AUZsKhI>) and click on this link for Arabic Language (<https://virginiatech.questionpro.com/t/AU3AUZsK2N>).

You can choose whether to be in this research study or not. You are as a volunteer to be in this research study, you may withdraw at any time without consequences of any kind. If you have any question about the study, feel free to send me an email at monerah@vt.edu

I appreciate your participation to my study.

Regards,

Name of researcher: Monerah Alduwairaj

Instructional Design and Technology

Virginia Polytechnic Institute and State University- United States.

Appendix F

Arabic Email to Faculty Members

السلام عليكم ورحمة الله وبركاته

أما بعد

المحترمين

أصحاب السعادة أعضاء هيئة التدريس

فالباحثة تجري دراسة بحثية بعنوان: "العوامل المحددة والتحديات التي تؤثر على أعضاء هيئة التدريس في تبني التعلم عن بعد في جامعات سعودية متعددة"؛ وذلك استكمالاً لنيل درجة الدكتوراة من جامعة فرجينيا تك في تخصص تصميم وتقنيات التعليم. وقد حصلت على موافقة أخلاقيات البحث العلمي من جامعة فرجينيا تك برقم ٢٢-٩٩٠ للبدء في جمع هذه الاستبانة. ويتم تطبيق هذه الدراسة من خلال جامعتي الإمام عبد الرحمن بن فيصل وجامعة الملك فيصل وجامعة بيشة في المملكة العربية السعودية. وستساعد إجاباتك على أسئلة الدراسة البحثية في تحديد التحديات التي قد تواجه (أو تعرض لها) أعضاء هيئة التدريس الذين يحاولون اعتماد التدريس عند بعد في طرقهم التعليمية. لذا قررت مشاركة هذه الدراسة البحثية، والاستبانة تعد كجزء من الدراسة البحثية، وستكون الأسئلة عن بعض التجارب الشخصية التي ربما تكون واجهتها في أثناء محاولتك استخدام التدريس عبر الإنترنت. ويتضمن هذا الاستطلاع أربعة أقسام والأسئلة المختلفة التالية اختيارية ومكتوبة. وتحقيقاً لأهداف الدراسة باعتباركم المحور الأساسي لهذه الدراسة، ولديكم خبرة علمية سابقة باستخدام التدريس عن بعد؛ وانطلاقاً من مبدأ التعاون، تأمل الباحثة التفضل باستقطاع جزء من وقتكم للإجابة على أسئلة الاستبانة التي تأخذ وقتاً يسيراً تقريباً من ٢٠ إلى ٢٥ دقيقة، وستكون الاستبانة متاحة باللغتين، للغة العربية اضغط على الرابط التالي:

(<https://virginiatech.questionpro.com/t/AU3AUZsK2N>)

وللغة الإنجليزية اضغط على الرابط التالي:

(<https://virginiatech.questionpro.com/t/AU3AUZsKhI>)

المشاركة في هذه الاستبانة تطوعياً ويمكنك الانسحاب في أي وقت متى رغبت في ذلك، وإذا كان لديك أي سؤال حول الدراسة،

فلا تتردد في مراسلتي على البريد الإلكتروني التالي: monerah@vt.edu

ولكم جزيل الشكر

الباحثة: منيرة عبد الرحمن الدويرج

جامعة فرجينيا تك

الولايات المتحدة الأمريكية

Appendix G

Virginia Tech IRB Permission



Division of Scholarly Integrity and
Research Compliance
Institutional Review Board
North End Center, Suite 4120 (MC 0497)
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-3732
irb@vt.edu
<http://www.research.vt.edu/sirc/hrpp>

MEMORANDUM

DATE: May 3, 2022
TO: Ken Potter, Monerah Abdulrahman Alduwairej
FROM: Virginia Tech Institutional Review Board (FWA00000572)
PROTOCOL TITLE: Determining Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabian Universities.
IRB NUMBER: 22-099

Effective May 3, 2022, the Virginia Tech Human Research Protection Program (HRPP) determined that this protocol meets the criteria for exemption from IRB review under 45 CFR 46.104(d) category (ies) 2(ii).

Ongoing IRB review and approval by this organization is not required. 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 activities impact the exempt determination, please submit an amendment to the HRPP for a determination.

This exempt determination does not apply to any collaborating institution(s). The Virginia Tech HRPP and IRB cannot provide an exemption that overrides the jurisdiction of a local IRB or other institutional mechanism for determining exemptions.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<https://secure.research.vt.edu/external/irb/responsibilities.htm>

(Please review responsibilities before beginning your research.)

PROTOCOL INFORMATION:

Determined As: **Exempt, under 45 CFR 46.104(d) category(ies) 2(ii)**
Protocol Determination Date: **May 3, 2022**

ASSOCIATED FUNDING:

The table on the following page indicates whether grant proposals are related to this protocol, and which of the listed proposals, if any, have been compared to this protocol, if required.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

Appendix H

Imam Abdulrahman bin Faisal University Permission



وزارة التعليم
Ministry of Education
043

جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

المملكة العربية السعودية
Kingdom of Saudi Arabia

Deanship of Scientific Research | عمادة البحث العلمي

إلى من يهمه الأمر،،

السلام عليكم ورحمة الله وبركاته،، أما بعد:

نفيد سعادتك بأنه لا مانع لدى عمادة البحث العلمي في جامعة الإمام عبد الرحمن بن فيصل من تعميم استبانة الباحث / منيرة بنت عبد الرحمن الدويرج من جامعة بيشة على أعضاء هيئة التدريس في جامعتنا لغرض إعداد دراسة علمية بعنوان: "العوامل المحددة والتحديات التي تؤثر على أعضاء هيئة التدريس في تبني التعلم عن بعد في جامعات سعودية متعددة"، حيث تم عرض الاستبانة على لجنة الأخلاقيات في جامعتنا وحصلت على الموافقة.

وتقبلوا أطيب تحية وتقدير،،

عميد عمادة البحث العلمي
د. نهاد بنت عبد الله العمير

مهرش . الربيعان

Dammam 31441 الدمام P.O.Box 1982 ص. ب www.iau.edu.sa
Fax. +966 13 333 0333 ف. ت. +966 13 333 2403 dsr@iau.edu.sa



الرقم: _____
التاريخ: ____/____/____
المشروعات: _____

تسهيل مهمة باحث

المحترمين

أصحاب السعادة أعضاء هيئة التدريس

السلام عليكم ورحمة الله وبركاته.. وبعد ،

انطلاقاً من مبدأ التعاون وتسهيل مهمة

الباحثة منيرة عبدالرحمن الدويرج

من جامعة بيشة

وذلك لتطبيق دراسة علمية بعنوان

"العوامل المحددة والتحديات التي تؤثر على أعضاء هيئة التدريس
في تبني التعلم عن بعد في جامعات سعودية متعددة"

نأمل التكرم بتسهيل مهمة الباحثة أعلاه وذلك من خلال
تعبئة الاستبانة الإلكترونية التالية:



نائب رئيس الجامعة للبحث العلمي والابتكار
أ.د. فهد بن أحمد الحربي

Appendix J

University of Bisha Permission

رقم القيد 19/1-22-000052 التاريخ 29/10/43

Kingdom of Saudi Arabia
Ministry of Education
University of Bisha
Vice Presidency For Graduate Studies
and Scientific Research



المملكة العربية السعودية
وزارة التعليم
جامعة بيشة
وكالة الجامعة للدراسات العليا
والبحث العلمي

سعادة وكيل جامعة الامام عبد الرحمن بن فيصل للدراسات العليا والبحث العلمي وفقه الله
سعادة وكيل جامعة الملك فيصل للدراسات العليا والبحث العلمي وفقه الله

السلام عليكم ورحمة الله وبركاته وبعد،،

نحيط سعادتكم بأن المحاضرة / منيرة عبد الرحمن الدويرج أحد المبتعثات من جامعة بيشة، ونظراً لحاجتها لإجراء دراسة علمية في جامعتكم الموقرة وتطبيق أداة الدراسة بعنوان " العوامل المحددة والتحديات التي تؤثر على أعضاء هيئة التدريس في تبني التعليم عن بعد في جامعات سعودية متعددة " وذلك على أعضاء هيئة التدريس في جامعتي الإمام عبد الرحمن بن فيصل وجامعة الملك فيصل من خلال الاستبانة على الرابط التالي: <https://virginiatech.questionpro.com/a/TakeSurvey?tt=iIF5hGtRMsk%3D>

أمل من سعادتكم الاطلاع والتوجيه لمن يلزم لتسهيل مهمة الباحثة المشار لها أعلاه.

وتقبلوا سعادتكم تحياتي وتقديري،،،

وكيل الجامعة

لِلدِّرَاسَاتِ الْعِلْمِيَّةِ وَابْحَاثِ الْعِلْمِ

د. عبد الرحمن بن سعد آل ثقفان

الرقم : ١٤٤٥ / ٢٢ / ١٠ / ٢٠١٩ التاريخ : ١٠ / ١٠ / ٢٠١٩ المرفقات :

ص.ب 551 الرمز البريدي 61922
البريد الإلكتروني vpgssr@ub.edu.sa
هاتف : +966 17 6238430



www.UB.edu.sa
نحو مجتمع معرفي مبدع

Appendix K

Section 3 of the Instrument Permission

From: Richard Hartshorne Richard.Hartshorne@ucf.edu
Subject: Re: Permission of adoption instrument.
Date: March 14, 2022 at 9:52 PM
To: Monerah Alduwairej monerah@vt.edu



Hello Monerah,

You have permission to use the instrument as outlined below.

Cheers,

Richard

Richard Hartshorne, Ph.D.
Chair, Department of Learning Sciences & Educational Research
Interim Director, School of Teacher Education
Professor, Instructional Design & Technology
Editor-in-Chief, *Journal of Technology & Teacher Education*
College of Community Innovation & Education
University of Central Florida
4000 Central Florida Blvd, ED 209D
Orlando, FL 32816
407.823.1861
richard.hartshorne@ucf.edu

Join me at SITE 2022, April 11-15, 2022 and online, in San Diego, California! site.aace.org/conf/

From: Monerah Alduwairej <monerah@vt.edu>
Sent: Monday, March 14, 2022 9:02 PM
To: Richard Hartshorne <Richard.Hartshorne@ucf.edu>
Subject: Permission of adoption instrument.

I am Monerah Alduwairej, I am a graduate student at Virginia Tech in Instructional Design and Technology. I am writing to ask for written permission to use the investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical instrument, my research study is Determining Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabian Universities. My research is being advisor by my professor, Kenneth Potter. I will use the instrument with replacement "Web 2.0" to "Online Teaching".

To use the instrument, I also would ask your permission to reproduce it in my dissertation appendix.

I would like to use your instrument under the following conditions:

- * I will use the instrument only for my research study and will not sell or use it for any other purposes
- * I will include a statement of attribution and copyright on all copies of the instrument. If you have a specific statement of attribution that you would like for me to include, please provide it in your response.
- * At your request, I will send a copy of my completed research study to you upon completion of the study.

If you do not control the copyright for these materials, I would appreciate any information you can provide concerning the proper person or organization I should contact.

If these are acceptable terms and conditions, please indicate so by replying to me through e-mail at monerah@vt.edu

I'm waiting for your response.

Sincerely,

Monerah

Appendix L

Figure Permission

From: Creswell, John creswell@med.umich.edu 
Subject: Re: Permission Request from Doctoral Candidate: Monerah Alduwairej
Date: October 25, 2022 at 1:54 PM
To: Monerah Alduwairej monerah@vt.edu, creswell@umich.edu



Dear Monerah, You have my permission. This is an adaption of my work so you should say, "Adapted from Creswell & Creswell, 2017). Thanks. John W Creswell

Get [Outlook for iOS](#)

From: Monerah Alduwairej <monerah@vt.edu>
Sent: Tuesday, October 25, 2022 6:47:15 AM
To: creswell@umich.edu <creswell@umich.edu>
Subject: Permission Request from Doctoral Candidate: Monerah Alduwairej

Dear John Creswell,

This is Monerah Alduwairej, Ph.D. candidate at Virginia Tech. I would like to request your permission to include a figure from the following publication in my dissertation.

Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.

I am conducting a research study (Determining Factors and Challenges Influencing Faculty Members to Adopt Online Teaching at Multiple Saudi Arabian Universities) to finish my doctoral dissertation. My Methodology includes references regarding figures of the convergent mixed methods (See attachment below), and I have cited your study within this section of my dissertation. Please note that the source will receive full credit for the manuscript. A reply to this email is sufficient to indicate your permission for my use of the mentioned material. If you no longer hold the copyright to this work, please indicate to whom I should direct my request.

Regards,

Monerah Alduwairej

Appendix M

Code Book for Qualitative Data Analyzed

Question 2

1. Faster.
2. Interactive with students.
3. Media such as Photos, Videos, and Maps.
4. Interactive tools.
5. Scientific resources (Journals, articles).
6. Quick and efficient (saves time in and ease in content arrangement and delivery for students, uploading insrtcions to digital platform: canvas).
7. White board.
8. Time consuming.
9. Need training.
10. Save data for future use.
11. Error less/accuracy and less mistakes/accuracy, good arrangement.

Categories

Theme	Description	Codes	Example
Media and Scientific Material	Use of Media, PPT, Videos, maps, photos and graphics, and research articles journals, other readily available material supporting course content.	3,4,5	“Make PowerPoint presentations and use images and stickers to grab attention”. "Relying on reliable scientific sources, often searching through a Google engine a specialization is a good option as well as providing references before the start of the semester (such as book mothers - and modern references) saves time when preparing the instruction in addition to raising the value of the scientific material presented”.
Easy, Quick and Accurate	Faster mode of communication with students, data transferring such as assignments, files uploading, time saving and accurate. It helps to organize material and prepare instruction and upload to Blackboard ahead of time.	6,1	“When I prepare my instructions, I used to arrange my documents and files in the USB to protect them from loss, so that I renew and develop my files for courses every year, as they are not similar to the documents of the previous year”. “When I prepare my instructions, I used to arrange my documents and files in the USB to protect them from loss, so that I renew and develop my files for courses every year, as they are not similar to the documents of the previous year”. “When preparing online instructions, I used to upload presentations early to allow learners to look at them and prepare questions early”.
Interactive	Interactive mode of learning and communicating with students virtually especially online teaching. It is easy to control white board as online, plan ahead and save resources for the future use.	2, 7, 10, 11	“When preparing online instruction, make sure to create an attractive presentation that helps me make the instruction interactive”. “I use the notability program on the iPad that enables me to write directly on a whiteboard, I do not share any pictures or PowerPoint presentations”.
Complex and Time consuming	Laborious and complicated for preparing online course are time consuming compared to traditional teaching, takes time to locate content, prepare slides, find relevant videos and supporting material. Needs training to use online resource and use for teaching.	8, 9	“This makes me take a long time to start the class and great effort and the cost of communication is high to be ready in front of the learners”

Question 3

1. Content sharing (uploading files, connectivity).
2. Difficulty, challenge, and problems.
3. Interactive/interaction through discussion, participation, self-learning, collaborative learning).
4. Use of various applications (gamification).
5. Video Presentation (YouTube etc.) PPT and other media usage.
6. Education outcomes and easy.

Categories

Theme	Description	Codes	Example
Content Quality	Use of Media, PowerPoint presentations (PPT), Videos, maps, photos and graphics, and research articles journals to motivate and gain attention of students. It includes course content sharing with students including PowerPoint presentations, study material or books.	1, 4, 5	<p>“Presentations help to present brief content to students when teaching distance courses and my presence together”.</p> <p>“When I teach my courses as online instructions, I make sure to make visual presentations and videos to attract the attention of the students and give them an opportunity to think and analyze”.</p> <p>“Activating gamification applications such as Kahoot is a good way to motivate students to focus while explaining groups and applying project-based learning methodologies and problem solving is an excellent way to activate modern teaching trends”.</p>
Interactive Mode	Interactive mode of learning and communicating with students virtually. It engages students in discussion, active participation, self-learning, and collaborative learning using e-learning strategies. It helps to attain educational outcomes and easy and convenient way to engage students.	3, 6	<p>“When I teach my courses as online instructions, resources such as video help my students interact, discuss and ask questions”.</p> <p>" Online teaching activates collaborative learning”.</p> <p>“Reading resources from previous work increases participation, interaction, and critical analysis”.</p>
Complex and Time consuming	Complicated and time-consuming process of preparing online course (e.g., locating relevant content, presentation slides, YouTube maps, charts, and other supporting materials).	2	<p>“I find it difficult to update presentations”.</p> <p>“When preparing my online instructions, I face the problem of Internet outage, as I postpone some of the instructions for other times”.</p>

Section 4

Q1 Advantages

0. No use, no advantage.
1. (Synchronous and) Asynchronous lecturing.
2. Easy use and communication.
3. Extra work and activities, evaluating.
4. Fast and Saves time (transmitting documents and instructions).
5. Flexible (rescheduling class for another time etc.
6. Interactive (direct contact and application of modern techniques and collaborative learning, exchange experience).
7. Self-learning and creative/critical thinking, motivation.
8. Modern mode of teaching that improve educational outcomes.
9. Students desire.

Categories

Theme	Description	Codes	Example
No use	There is no advantage in online teaching process.	0	“There are no advantages”
Flexibility	There is flexibility in scheduling asynchronous and synchronous instructions, with option of rescheduling for another time. Faculty members and students have options to login anywhere to instructions and students can benefit from recorded instructions too.	1, 5, 9	“I don't think there is a perceived advantage or benefit”.
Easy and Fast	It is fast and easy to communicate with students, transferring documents, saving for future use that saves effort and time.	2, 4	“The advantages are wonderful and suitable for a faculty member, such as simultaneous instructions, allowing them to be performed at the same time from anywhere”.
Interactive	It is fast and easy to communicate with students, transferring documents, saving for future use that saves effort and time.	3, 6, 7, 8	“It has proven its effectiveness in terms of student communication anywhere and time commitment”. “Saving time and facilitating the delivery of information, as well as the availability of recorded instructions, so that the student can resort to them wherever he wants”. “Ease of setup and display”. “Save the information for the student to refer to it at any time”.

Q2 Disadvantages

0. There is no perceived disadvantage.
1. Assessment is not possible (cannot assess whether student is learning or not, no reliable exams).
2. Science Lab work is not feasible.
3. Students show less interest and malfunctioning.
4. Technical Issues such as system updates, Internet and technology failures, loss of information and files. Purchasing software and updating some tools. High Cost of software and high-speed Internet.
5. Time consuming and complicated (training required) burden on a faculty member.
6. Zero eye contact (lack of direct interaction/face to face) no video communication only audio connection, not equal to in-person learning, lack of social interaction.
7. Cost.

Categories

Theme	Description	Codes	Example
No Disadvantage	There is no perceived disadvantage.	0	“There are no Disadvantages”.
Technical and connectivity issues	Use of Media, PowerPoint presentations (PPT), Videos, maps, photos and graphics, and research articles journals to motivate and gain attention of students. It includes course content sharing with students including PowerPoint presentations, study material or books.	4	“Stress, devices always need updates and downloads, which makes me nervous a lot”. “Suddenly there are problems that make me lose some of my documents”. “I find it difficult to communicate sometimes, which forced me to communicate with the communication company every time to make the necessary repairs”.
Lack of Face-to-face Interaction	Interactive mode of learning and communicating with students virtually. It engages students in discussion, active participation, self-learning, and collaborative learning using e-learning strategies. It helps to attain educational outcomes and easy and convenient way to engage students.	3, 6, 1, 2	“Loss of physical interaction”. “Do not make up for in-person instructions and lower learning outcomes”. “The nature of the academic program in my clinical lab sciences, practical training is a must which CAN NOT BE DONE using the online tool”. “Not suitable for all courses, especially scientific courses”.
Costly and Complicated	Complicated and time-consuming process of preparing online course, (e.g., locating relevant content, presentation slides, YouTube maps, charts, and other supporting materials).	7, 5	“The cost of some tools and need high amounts”. “The cost, the educational software tools have become very expensive”.

Question 3 (Challenges)

0. No challenge.
1. Cost.
2. Interactive tool (students' engagement).
3. Internet connection/technical /connectivity.
4. Lack of expertise, ability to use digital tools (training needed).
5. Lack of time (time to practice tools and prepare for instructions) time and effort, sitting all day in front of machine, physical exertion.
6. Lack of university support.
7. Training for clinical and practical work to students/learner experience and attitude.
8. Testing/effective evaluation is not possible.
9. complex (difficult to communicate), less interactive.

Categories

Theme	Description	Codes	Example
No Challenges	No challenge.	0	“There are no challenges”.
Time Consuming and complex	Lack of time to practice online teaching interactive tools, s physical exertion, extra time to prepare and practice instructions, uploading files, and locating content to present in the class, waiting for system updates.	5	“Time and effort in using online tools”. “Time and effort training on new technology tools”. “Effort and time, and sometimes you have to be connected to the Internet all the time and day”.
Lack of Skills and Support	Digital tools are complicated and complex, and there is no support available from university, faculty lacks necessary skills to prepare and deliver online instructions.	4, 6	“Engaging students”. “Clinical and practical training of students”.
Lack of Physical Interaction	There is no faculty members or students physical interaction. Students are not fully engaged in learning process, and often communicating with students is difficult. testing is not reliable and practical work is not possible in online teaching.	2, 7, 8, 9	“Lack of knowledge of the course faculty memvers or students about the distance teaching process”. “Effort to train on new technology tools for me and ask for help frequently”.
Connectivity and Cost	There is connectivity problem that cause interruption. Costly high-speed Internet, and computing devices such as laptops, computers, and other device for online teaching. It includes purchasing software and buying subscriptions of online meeting tools.	1, 3	“Many design programs are not paid by the university and are rather expensive, which makes me switch to less useful and free programs”. “Internet connection is expensive”. “Internet outage and high cost”.

Question 4

Benefits in Preparation for Online Teaching

0. No benefit.
1. Easy to use and prepare (simple).
2. Fast and quick (fast communication and delivery of documents) (save time, readymade content).
3. Flexible.
4. New skills, technology (facilitate learning, advance options, content sharing etc.)
5. Synchronous and asynchronous.
6. Use previously developed work and save for future use.
7. Interactive.
8. Technical.
9. Time and effort.

Categories

Theme	Description	Codes	Example
No benefit	There is no benefit of using online tools	0	“There is no”.
Fast and Flexible	It is fast and flexible mode to prepare for instructions, and material is easily available, quickly downloaded or uploaded for student’s immediate use. The flexibility allows faculty members to change the content and use it anytime anywhere, even can save for future use.	2, 3	“Ease of modification and the use of flexible learning tools”.
Simple to Communicate	Online instructional system is simple to use for faculty members. Faculty members are able to communicate with their students via emails or text messages when needed and send prompt feedback.	1	“Easy use of digital teaching resources”. “Facilitate the educational process”.
Synchronous and Asynchronous Instructions	It includes synchronous and asynchronous instructions, saved instructions and other material for future use, interactive mode of instruction which require effort and time.	4, 5, 6, 7, 8, 9	“Synchronous instruction and quizzes quick preparation issuance of electronic certificates automatically recording synchronous instructions / seminars / courses ... etc.”. “Memorizing educational materials and using them in different classrooms”.

Question 5

Benefits of Online Instruction Delivery

0. No.
1. Easy.
2. Flexible.
3. Interactive (discussion, sharing ideas) learning through communication and thinking.
4. Learned New skills/knowledge of computer-based learning.
5. No visual contact.
6. Save time/Fast, quick, and speed.
7. Synchronous and asynchronous.
8. Students' choices.
9. Digital content.

Categories

Theme	Description	Codes	Example
No	No benefits	0	“There is no”.
Easy and Flexible	The digital interface for online teaching is easy to use, simple and flexible in scheduling, and delivering online instructions.	1, 2	"Flexibility and enhance learning for students and break the routine". “Change the atmosphere of attendance instructions and cut the routine”.
Interactive	It is interactive, which allows students to engage in constructive online discussion and self-learning at their own pace and convenience. The students like online instructions to some extent. It provides direct contact without face-to-face interaction.	3, 8, 9	“Enhance learning through thinking and communication skills”. “Ease of communication with students”.
Synchronous Asynchronous	The online teaching process provides opportunity of synchronous and asynchronous instructions, allowing students to revisit instructions and confirm the information discussed in the class. It allows learning and practicing new skills of using digital media (computer and software), saves times, and delivers the digital content faster.	4, 5, 6, 7, 9	“Students' interaction and desire for continuity of synchronous distance learning”. “Enhance discussion skills and enrich knowledge”.