

STUDENTS' PORTAL USAGE MODEL BASED ON SOCIAL  
COGNITIVE THEORY IN SAUDI ARABIA UNIVERSITIES

ALATAWI SALEM SULIMAN T

A thesis submitted in fulfilment of the  
requirements for the award of the degree of  
Doctor of Philosophy

School of Computing  
Faculty of Engineering  
Universiti Teknologi Malaysia

JULY 2020

## **DEDICATION**

### **Special thanks:**

*To my beloved family  
My Father, Mother, Brothers, and Sisters.*

*To my supervisor  
Thank you very much for everything*

## **ACKNOWLEDGEMENT**

In the Name of Allah, the Beneficent, the Merciful

First of all, I must thank Allah who gave me ability, patience, and help me to complete this study. Peace and blessing be upon our prophet Mohammed.

Second, I would like to express special thanks and gratitude to my supervisor Dr. Syed Norris Hikmi Syed Abdullah for his guidance, patience, dedication, and encouragement during my study at UTM. I have the highest respect and admiration for his generous support and guidance during all stages in doctorate degree.

Third, I would like to express special thanks and gratitude to my brother Dr. Fahad Mahamoud Ghabban for his time, guidance, encouragement, and unlimited support throughout my study.

Finally, I want to thanks my beloved parents for their support and constant encouragement to me during my study. They always ask Allah to help me in their prayers. May Allah bless and protect them.

## **ABSTRACT**

Student portal plays a vital role in the advancement of education system. In particular, student portal has been utilised to complement the formal education system by making knowledge and services available to all users. Hence, student portal is considered as a gateway that integrates information from different sources accessible to all the students based on their needs. Although most Saudi Arabia universities are currently equipped with good ICT infrastructure, the usage of student portal remains low. Therefore, there is a need to improve students' portal based on specific requirements deemed appropriate. This research aims to formulate a model for student portals usage that incorporates factors that affect students' engagement with the portal. This research employed Social Cognitive Theory (SCT) theory to build the model based on students' expectations and perceptions. Feedback gathered from survey involving 399 students from four Saudi Arabia universities were analysed using Smart-PLS quantitative analysis tools. The findings from this research revealed that eight out of ten factors were found to be significant and positively affect the students' portal usage. These factors include user satisfaction, design, availability of content, user intention, efficiency, portal user support, portal service quality and interaction. The enhancement of students' portal usage based on the above significant factors will assist universities in increasing their portal usage as well as the corresponding services provided.

## ABSTRAK

Portal pelajar memainkan peranan penting dalam kemajuan sistem pendidikan. Secara khususnya, portal pelajar telah digunakan untuk melengkapkan sistem pendidikan formal dengan menyediakan pengetahuan dan perkhidmatan untuk semua pengguna. Oleh itu, portal pelajar dianggap sebagai gerbang yang menyatukan maklumat dari pelbagai sumber yang dapat diakses oleh semua pelajar berdasarkan keperluan mereka. Walaupun kebanyakan universiti Arab Saudi pada masa ini dilengkapi dengan infrastruktur ICT yang baik, penggunaan portal pelajar masih rendah. Oleh itu, terdapat keperluan untuk meningkatkan portal pelajar berdasarkan keperluan khusus yang difikirkan sesuai. Penyelidikan ini bertujuan untuk merumuskan model penggunaan portal pelajar yang merangkumi faktor-faktor yang mempengaruhi penglibatan pelajar dengan portal tersebut. Penyelidikan ini menggunakan Teori Kognitif Social (SCT) untuk membina model berdasarkan harapan dan persepsi pelajar. Data yang dikumpulkan daripada maklum balas soal-selidik yang melibatkan 399 pelajar daripada empat universiti di Arab Saudi dianalisis menggunakan alatan analisis kuantitatif Smart-PLS. Hasil kajian ini menunjukkan bahawa terdapat lapan daripada sepuluh faktor didapati mempengaruhi penggunaan portal pelajar secara signifikan dan positif. Faktor-faktor ini merangkumi kepuasan pengguna, reka bentuk, ketersediaan kandungan, niat pengguna, kecekapan, sokongan pengguna portal, kualiti dan interaksi perkhidmatan portal. Peningkatan penggunaan portal pelajar berdasarkan faktor penting di atas akan membantu universiti dalam meningkatkan penggunaan portal mereka serta perkhidmatan yang sesuai.

## TABLE OF CONTENTS

	<b>TITLE</b>	<b>PAGE</b>
	<b>DECLARATION</b>	<b>iii</b>
	<b>DEDICATION</b>	<b>iv</b>
	<b>ACKNOWLEDGEMENT</b>	<b>v</b>
	<b>ABSTRACT</b>	<b>vi</b>
	<b>ABSTRAK</b>	<b>vii</b>
	<b>TABLE OF CONTENTS</b>	<b>viii</b>
	<b>LIST OF TABLES</b>	<b>xiii</b>
	<b>LIST OF FIGURES</b>	<b>xv</b>
<b>CHAPTER 1</b>	<b>INTRODUCTION</b>	<b>1</b>
	1.1 Introduction	1
	1.2 Problem Background	2
	1.3 Problem Statement	6
	1.4 Research Questions	6
	1.5 Research Objectives	7
	1.6 Research Scope	7
	1.7 Significance of The Research	8
	1.8 Thesis Structure	9
<b>CHAPTER 2</b>	<b>LITERATURE REVIEW</b>	<b>11</b>
	2.1 Introduction	11
	2.2 Higher Education in Saudi Arabia	12
	2.2.1 Saudi Arabia's Vision 2030 Themes	13
	2.2.2 Saudi Arabia Universities	15
	2.2.3 Under-developed Universities in Saudi Arabia	17
	2.3 Web Portal Overview	18
	2.4 Current State of Students' Portal Usage	20
	2.4.1 Portal Usage in Saudi Arabia Universities	24

2.5	User Behavior	28
2.6	Factors Affecting Students to Use Student Portal	30
2.7	Theories Used in University Web Portal	37
	2.7.1 Technology Acceptance Models (TAMs)	38
	2.7.2 Delone and Mclean's Information System Success Model	39
	2.7.3 Social Cognitive Theory (SCT)	39
2.8	Use of Social Cognitive Theory in Web Portals	40
2.9	Chapter Summary	42
<b>CHAPTER 3</b>	<b>RESEARCH METHODOLOGY</b>	<b>43</b>
3.1	Introduction	43
3.2	Research Paradigm	43
3.3	Research Approach	44
3.4	Research Design	48
	3.4.1 Phase 1: Problem Definition	49
	3.4.2 Phase 2: Model Development	50
	3.4.3 Phase 3: Instrument Development and Validation	53
	3.4.3.1 Step 1: Define the Constructs and Content Domain	53
	3.4.3.2 Step 2: Generate and Assess Measurement Items	54
	3.4.3.3 Step 3: Develop and Define the Scale	61
	3.4.4 Phase 4: Data Collection and Analysis	67
	3.4.5 Phase 5: Results and Discussion	68
3.5	Chapter Summary	68
<b>CHAPTER 4</b>	<b>DEVELOPMENT OF STUDENT PORTAL MODEL</b>	<b>69</b>
4.1	Introduction	69
4.2	Theoretical Background	69
	4.2.1 Behavioral	70
	4.2.2 Personal	70
	4.2.3 Environmental	70

4.3	Dependent Variable; Student Portal Usage	72
4.4	Independent Variable	73
	4.4.3 Interaction	75
4.5	Hypothesis Development and Proposed Model	84
	4.5.1 Environmental Factors Category	84
	4.5.1.1 User Satisfaction	85
	4.5.1.2 Information Quality	85
	4.5.1.3 Interaction	85
	4.5.1.4 Availability of Content	86
	4.5.1.5 Portal Service Quality	86
	4.5.1.6 Design	87
	4.5.1.7 Navigation	87
	4.5.1.8 User Support	88
	4.5.2 Personal Factors Category	88
	4.5.3 Behavioral Factors Category	89
4.6	Chapter Summary	90
<b>CHAPTER 5</b>	<b>DATA COLLECTION AND ANALYSIS</b>	<b>91</b>
5.1	Introduction	91
5.2	Pilot Study	91
	5.2.1 Items Reliability	93
	5.2.2 Construct Reliability and Validity	94
	5.2.3 Discriminant Validity	95
5.3	Main Survey Data Screening	99
5.4	Demographics of Participants for Main Survey	99
5.5	Data Analysis	101
	5.5.1 Measurement Model	102
	5.5.1.1 Reliability of Internal Consistency	102
	5.5.1.2 Convergent Validity	103
	5.5.1.3 Discriminant Validity	107
	5.5.2 Structural Model	109
	5.5.2.1 Collinearity Assessment	110



	5.5.2.2	Structural Model Path Coefficients	112
	5.5.2.3	Coefficient of Determination ( $R^2$ )	116
	5.5.2.4	Effect Size $f^2$	116
5.6		Discussion of Hypothesis Results	118
	5.6.1	Discussion of Environmental Category Hypothesis	120
	5.6.1.1	Hypothesis (Ha1)	120
	5.6.1.2	Hypothesis (Ha2)	121
	5.6.1.3	Hypothesis (Ha3)	122
	5.6.1.4	Hypothesis (Ha4)	123
	5.6.1.5	Hypothesis (H5)	124
	5.6.1.6	Hypothesis (Ha6)	125
	5.6.1.7	Hypothesis (Ha7)	125
	5.6.1.8	Hypothesis (Ha8)	127
	5.6.2	Discussion of Personal Category Hypothesis	127
	5.6.2.1	Hypothesis (Hb1)	128
	5.6.3	Discussion of Behavioral Category Hypothesis	128
	5.6.3.1	Hypothesis (Hc1)	129
5.7		Concluding Results of Hypothesis	129
5.8		Chapter Summary	131
<b>CHAPTER 6</b>		<b>CONCLUSION AND RECOMMENDATIONS</b>	<b>133</b>
6.1		Introduction	133
6.2		Research Achievements	133
	6.2.1	Research First Objective	133
	6.2.2	Research Second Objective	134
	6.2.3	Research Third Objective	135
6.3		Research Contribution and Implications	136
	6.3.1	Theoretical Contribution	137
	6.3.2	Practical Contribution	138
6.4		Research Limitation	139
6.5		Future Works	140

6.6	Chapter Summary	140
<b>REFERENCES</b>		<b>141</b>
<b>Appendix A</b>	<b>Students Preliminary Study</b>	<b>159</b>
<b>Appendix B</b>	<b>Academic Staff Preliminary Study</b>	<b>161</b>
<b>Appendix C</b>	<b>Questionnaire Validation</b>	<b>169</b>
<b>Appendix D</b>	<b>Pilot Study</b>	<b>177</b>
<b>Appendix E</b>	<b>Main Data Collection</b>	<b>189</b>

## LIST OF TABLES

<b>TABLE NO.</b>	<b>TITLE</b>	<b>PAGE</b>
Table 2. 1	Saudi Arabia Universities	15
Table 2.2	Under-developed Universities in Saudi Arabia	17
Table 2. 3	Result of Portal Usage Survey	24
Table 2. 4	Summary of Factors Classification	36
Table 2. 5	Theories Used in Web Portal	38
Table 3. 1	Differences between the Quantitative and Qualitative Research Methodologies	45
Table 3. 2	Statistical Analysis Tools Usage	47
Table 3. 3	Steps of Phase Three	53
Table 3.4	Constructs and Generated Items	55
Table 3.5	Experts' Profile	61
Table 3. 6	Deleted Items Based on Pilot Test Results	63
Table 3.7	Morgan's Table for Sample Size	65
Table 3.8	Population of Students in Saudi Arabia Universities	66
Table 3.9	Student Population in Four Public Universities	67
Table 5.1	Demographic of Participants	92
Table 5.2	Factor Loading	93
Table 5.3	Constructs' Reliability and Validity	95
Table 5.4	Items' Cross Loading for All Constructs	96
Table 5.5	Participants' Demographic	101
Table 5.6	Measurement Model Standard Criteria	102
Table 5.7	Reliability of Internal Consistency	103
Table 5.8	Items Outer Loading and Average Variance Extracted (AVE)	104

Table 5.9	Cross Loadings of Discriminant Validity	107
Table 5.10	Fornell-Larcker of Discriminant Validity.	109
Table 5.11	Structural Model Evaluation Procedures	110
Table 5.12	Collinearity Test	111
Table 5.13	Result of Hypothesis Test	113
Table 5.14	Significant Level of The Result of The Study Hypothesis	114
Table 5.15	Coefficient of Determination ( $R^2$ )	116
Table 5.16	The Effect Size of ( $f^2$ ) Result.	117

## LIST OF FIGURES

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE</b>
Figure 2.1	Literature Review Framework	11
Figure 2. 2	Academic Staff Participants	27
Figure 3. 1	Research Design	49
Figure 3. 2	Factors Derivation Process	52
Figure 4.1	Social Cognitive Theory (SCT) domains (Bandura, 1986)	69
Figure 4.2	Portal Enhancement based on (SCT)	71
Figure 4.3	Student Portal Usage	73
Figure 4.4	User Satisfaction	74
Figure 4.5	Information Quality	75
Figure 4.6	Interaction	76
Figure 4.7	Availability of Content	78
Figure 4.8	Portal Service Quality	79
Figure 4. 9	Design	80
Figure 4.10	Navigation	81
Figure 4.11	Portal User Support	81
Figure 4.12	Efficiency	83
Figure 4.13	User Intention	84
Figure 4.14	Study Proposed Model	90
Figure 5.1	Pilot Study Measurement Mode	98
Figure 5.2	Measurement Model Final Result.	106
Figure 5. 3	Structural Model Path Coefficient	115
Figure 5.4	Student Portal Usage Model	118



## LIST OF APPENDICES

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
Appendix A	Students Preliminary Study	159
Appendix B	Academic Staff Preliminary Study	161
Appendix C	Questionnaire Validation	169
Appendix D	Pilot Study	177
Appendix E	Main Data Collection	189

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Nowadays, with the development of web portals, new features exposed to students which support interactivity and personalization. Amongst the significant of development in the digital era are portals. Higher education institutions are seriously involved in portals that turned to be an essential tool for delivering services and increased the interaction between students and academic staff (Shaltoni et al., 2015). According to Gul and Saqib (2015) educational portals are destined to provide information to a wide variety of users. Users of these types of portals are mainly concerned with the ease of finding information in a timely manner. Also, Al-Dossari (2017) and Mansourvar and Yasin (2010) defined student portal is referred to as the general knowledge management system that helps the companies to share, reuse, create or exchange any type of information or knowledge. A well designed student portal will help the user to get access to different backend resources'; it acts as a gateway between the users and the backend resources (Al-Dossari, 2017; Bringula, 2013; De Luca et al., 2011). Student portal will help and provide its final individual customers with a specialised view which matches their need of both the software as well as the hardware resources that is very specific to the user's domain. One of the major challenge is to build a university student portal which is updated regularly with the latest information and also is ready to adapt to the increasing services (Thomas-Alvarez and Mahdjoubi, 2013). Therefore, the main concern of the university is to build a portal that controls and coordinates as well as it interacts and takes feedback from the customers (visitors, staff, or may be the students) which will support the end-users to achieve to build a portal that will meet the expectation (Hassan, 2013). By understanding what students hope/expect from a university portal should increase their satisfaction and consequently have a positive impact on performance and reputation (Akanmu and Bahaudin, 2018; Li, Asimiran, and Suyitno, 2018; Shaltoni et al., 2015).



## 1.2 Problem Background

Nowadays, web portal is known as a one-stop website to receive an organisation's latest updates. High-quality web portals are very important to commercial and non-commercial organisations (Al-Dossari, 2017; Nasirun et al., 2012). Mansourvar and Yasin (2010) defined the portal as a general knowledge management system that helps companies to share, reuse, create or exchange information. Educational web portals become more of a responsive portal and also has turned out to be very dynamic based on the demands and the requirements of the different academic community. These days the communication between the teachers and students are also done through these websites sometimes. These portals actually integrate the application, content and the information together to help the end user. University students' portal will help provide customers with a specialised view that matches their needs and meets their software and hardware requirements. The understanding of the users need is a key element in the university students' portal usage. It mainly includes four important things namely the accessibility standards, page layout, the graphic design and most importantly the content design (Hassan, 2013). Therefore, the main concern of the university is to build a portal that able to controls, coordinates and received feedback from the customers (i.e. visitors, staff, or may be the students). Such input contributes to developing a portal that will meet the expectations of end-users as well as meet industry standards (Al-Dossari, 2017; Hassan, 2013).

According to the Ministry of Education of Saudi Arabia and academic institutions of ranking international universities, King Saud University and King Abdul-Aziz University are the top five universities in Saudi Arabia (QSranking, 2019; TimeHigherEducation, 2019). Bahaj, Aljaaidi, and Ahmed (2019) indicated that information technology infrastructure is a key success factor that increases students' confidence in using Saudi university portals. As such, Al-Harbi (2016) recommended updating the information of the portal, e-services, and redesigning the portal in order to increase its use. According to Al-Harbi (2016) examine the attitudes of faculty members towards the of virtual learning portals in teaching language programs at a major university in Saudi Arabia. The result revealed that there is main problem was

their opinions about using e-service technology tools in their portal. Gul and Saqib (2015) evaluate the level of usage of King Abdul Aziz university portal by using Heuristics evaluation. The results revealed that the university portal does not match standards of design, content, user support and navigation which make students dissatisfied and decreased the usage of portal. Also, this study recommended to improve university of King Abdul Aziz portal usage. Ahmed and Al-Reyaae (2017) evaluate and compare the awareness and the level of usage electronic resources portal among students in Al-Jouf University. The study concludes that the undergraduate students at Al-Jouf University lack the necessary information skills needed to meet their academic and research requirements in order to continue to use their portal.

Alhabeeb et al., (2017) examine different factors that affect student to use their portal and to determine the level of use e-learning portal in Saudi Arabia and doing comparison for these results with previous studies conducted in other countries. The results revealed that technical infrastructure of portal, and instructor knowledge with using portal technologies and student knowledge of using computer systems are important to success and increase the usage of the portal. Alshamari (2016) conducted a comprehensive literature to identify the current state of the level of use of health information systems' portal in Saudi Arabia. The result findings revealed that different factors such as: design, privacy, and efficiency effect on the portal usage. Also, this study recommended to consider these factors in the developing and designing the portal for producing successful implementation portal and increase the portal usage. Elsayed (2016) examine the current situation of King Abdulaziz University portal content and applied propose a content strategy. The study is an important because the portal content strategy will help the university to solve portal content issues and encourage users to use the portal. also, this study recommended to examine perceptions of student with using their portal.

Al-Mashaqba (2017) examine the level of usage of academic members in Alqassim University in Saudi Arabia. The results showed that the academic members don't have awareness about using the available services in the portal which can use in their teaching through the portal. This study revealed that there is need to increase the level of usage by training the academic members on how to use their services in the

portal. Almahamid et al., (2016) examine the level of usage of university portal by identifying the factors that effect on lectures to use their portal. the result revealed that there some issues facing them to use university portal such as: navigation, a quick response time, minimum download time, and portal accessibility issues. This study recommended university decision makers and web designers have to take into consideration these issues to increase the level of usage of the portal. Alkahtani (2016) examine students attitudes towards using electronic information resources of Princess Nora University students library portal. The study results revealed that management should take this investigation into account and attempt to decrease the gap between student attitude and their use to increase portal usage. Also, to increase the level of awareness and the importance of library portal electronic resources and its actual use. According to Benaïda et al., (2018) the study examines the level of usage King Abdul-Aziz university portal among of undergraduate students. The result revealed that students dissatisfied with their students' portal. The study recommended to improve the level of portal usage by solving the problems that face students.

In spite of the advancements being made in the domain of mobile portal in Saudi Arabia, there are aspects that present obstacles in the progress of mobile portal in the nation. According to Badwelan et al.,(2016) ascertained several limitations related to mobile learning in Saudi Arabia, such as the limitations with regards to processing performance, memory size, battery life, elementary user interface and various platforms. Other concerns encompass the availability of dependable and inexpensive web access from home, because campus IT security in universities of Saudi Arabia makes it tough for students who are away from campus to access the systems on campus. Also, Alkhalaf (2015) highlighted that there are challenges which students encountered, like substandard wireless network and technical concerns, considerably limited these benefits. Utilising mobile phones for education would render likely issues regarding hardware specifications of the devices involved: small screen sizes, inadequate input options, inadequate battery life, inadequate memory capacity and video quality; all these restrict M-learning assimilation if it is not conforming to a homogenous setup and system (Albazie, 2018; Alkhalaf, 2015). Therefore, based on these limitation, this study focus on student web portal in Saudi Arabia universities.

Furthermore, the researcher of this study conducted two preliminaries studies on academic staff and students in Saudi Arabia universities. In order to observe the problem from the ground, the researcher conducted the first preliminary study based on the students' perspective about their portal. The researcher performed an online survey to collect data about the student portal in different universities in Saudi Arabia. The sample of the study involved 19 questions and 91 responders distributed randomly across many universities in Saudi Arabia. The second preliminary study was conducted on academic staff to make sure that there is a problem in the student portal from the point of view of institutions. The researcher conducted an online survey with 40 academic staff from various universities in Saudi Arabia. The finding of both preliminary, highlighted some of the problems faced by students in Saudi universities such as: lack of the portal content, lack in training and guidelines, lack interaction between students and their lecturers, and lack of awareness about using the portal. These issues affect students to use their portal. Therefore, according to above results this level of using portal in Saudi universities doesn't match the advantage of portal.

Also, this study used social cognitive theory SCT, which is regarded as a very powerful theory related to human behaviour. Two studies D. R. Compeau and Higgins (1995b) and D. Compeau, Higgins, and Huff (1999) applied the SCT for investigating the computer utilisation. They investigated the computer usage however, the nature of their proposed model along with its theory allowed its extension to the acceptance and usage of the web portals. The SCT was regarded as the base model because of the following reasons; first, the constructs that were used in the model represented the important variables that were analysed as the factors which were responsible for improving the web portal. Second, since the SCT was a relatively less-represented model in the adoption of the web portals, it was important to investigate its performance and application in the existing context. Finally, this model included all the appropriate and vital constructs that helped in understanding the behaviour of an individual. According to several previous studies that indicate to the important of student behaviour to enhance the use of university portals. According to M.-Y. Wu et al., (2011) this study approved that user behaviour is important key to enhance and continue using the website. According to Benlian (2015) this study indicates that user behaviour and perceived enjoyment on websites are important to increase the usage of website. Also, considering user behaviour provide useful guidelines for designers to

This research focus on undergraduate students in Saudi Arabia universities to understand what are their needs based on their experience in using students' portal. that will help universities to improve the students' portal based on their students' demands and requirements.

This research selected four under developing public universities in Saudi Arabia as case studies. These universities are :(University of Tabuk, Taibah University, Taif University, and King Faisal University) which located in different states in Saudi Arabia to determine the potential respondents to achieve the study goals. The private universities are not involved in this study.

### **1.7 Significance of The Research**

This study is a contribution to research through identifying the most important factors which affect students to use their student portal in Saudi Arabia universities. The study emphasises the challenges and issues that face students to use their portal and which ways that can help to solve these issues. This study investigates the perceptions of undergraduate students towards the using of students' portal based on their experiences.

The study further contributes to knowledge for theoretical and practical aspects of using students' portal. Theoretically, the study assesses the importance of student portal which enhance student portal usage and increase students' satisfaction in Saudi Arabia universities. In particular, the study illustrates how can the most important factors that affect students to use their student portal in Saudi Arabia universities can enhance the level of using university student portal. Also, this study is the first study to use Social Cognitive Theory (SCT) to examine the personal, behavioural and environmental factors to enhance student portal usage and increase student satisfaction in Saudi universities. The recommendations and implications of this research of how can these factors can be implemented to enhance and improve the communication and relationship management with students to encourage them to use their portal.

## REFERENCES

- Abdel-Jaber, H. (2017). Experimental Analysis of Students' Satisfaction Factors in E-Learning Environment: A Case Study on Saudi Arabian University. *Journal of Information & Knowledge Management*, 16(02), 1750018.
- Abdulhamid, S. M., & Idris, I. (2014). Design Evaluation of Some Nigerian University Portals: A Programmer's Point of View. arXiv preprint arXiv:1402.1241.
- Aggarwal, A. K. (1999). *Web-Based Learning and Teaching Technologies: Opportunities and Challenges*: IGI Global.
- Ahmed, A., & Al-Reyae, S. (2017). Knowledge and use of electronic information resources by medical students at Al-Jouf University in Saudi Arabia. *Library Philosophy and Practice*.
- Ahn, T., Ryu, S., & Han, I. (2007). The impact of web quality and playfulness on user acceptance of online retailing. *Information & Management*, 44(3), 263-275.
- AI-Youbi, A. O. (2017). The development and advancement of HE in Kingdom of Saudi Arabia. Retrieved from <http://www.qswownews.com/2017/05/31/development-advancement-higher-education-kingdom-saudi-arabia/>
- Ainin, S., Bahri, S., & Ahmad, A. (2012). Evaluating portal performance: A study of the National Higher Education Fund Corporation (PTPTN) portal. *Telematics and Informatics*, 29(3), 314-323.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- Ajzen, I., & Fishbein, M. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*: Reading, MA: Addison-Wesley.
- Akanmu, M. D., & Bahaudin, A. Y. (2018). Analysis of the Factors affecting Satisfaction of Students in using University Portal: A Case Study of Universiti Utara Malaysia.
- Al-Dossari, H. (2017). A heuristic-based approach for usability evaluation of academic portals.

- Al-Harbi, M. (2016). Faculty attitudes toward and motivation for Virtual Learning Environments (VLE) for language studies: A cross-national study in Saudi Arabian universities. *Journal of Psychology and Behavioral Science*, 4(2), 100-114.
- Al-Mashaqba, N. J. a. H. (2017). Use of Blackboard Collaborate at Qassim University: Evaluating Teachers' Perceptions. *Sino-US English Teaching*, 14(2), 76-85.
- Al-Qeisi, K., Dennis, C., Alamanos, E., & Jayawardhena, C. (2014). Website design quality and usage behavior: Unified Theory of Acceptance and Use of Technology. *Journal of Business Research*, 67(11), 2282-2290.
- Alasem, A. N. (2013). Evaluating the usability of Saudi Digital Library's interface (SDL). Paper presented at the Proceedings of the World Congress on Engineering and Computer Science.
- Albalawi, W. (2014). Evaluating the usability of SAFEER e-services implemented by the Saudi Arabian Cultural Mission (SACM) in the USA. *Journal of Management and Marketing Research*, 17, 1-16.
- Albazie, H. A. (2018). Advantages and challenges of integrating m-learning into saudi arabian universities: A literature review. *European Journal of Open Education and E-learning Studies*.
- Alhabeeb, A., Alhabeeb, A., Rowley, J., & Rowley, J. (2017). Critical success factors for eLearning in Saudi Arabian universities. *International Journal of Educational Management*, 31(2), 131-147.
- Alkahtani, L. (2016). The Attitudes of Princess Nora University Students Towards Using Electronic Information Resources of the Library. *Proceedings from the Document Academy*, 3(2), 8.
- Alkhalaf, S. (2015). Evaluating m-learning in Saudi Arabian higher education: a case study. arXiv preprint arXiv:1510.03189.
- Almahamid, S. M., Tweiqat, A. F., & Almanaseer, M. S. (2016). University website quality characteristics and success: lecturers' perspective. *International Journal of Business Information Systems*, 22(1), 41-61.
- Alotaibi, M. B. (2013). Assessing the usability of university websites in Saudi Arabia: A heuristic evaluation approach. Paper presented at the Information Technology: New Generations (ITNG), 2013 Tenth International Conference on.

- Alshamari, M. (2016). Usability Factors Assessment in Health Information System. *Intelligent Information Management*, 8(06), 170.
- Alsharif, K. M. (2011). Towards quality teacher education: Productive pedagogies as a framework for Saudi pre-service teachers' training in mathematics education. Curtin University.
- Alturise, F., & Alojaiman, B. (2013). Benefits and challenges of using ICT in Saudi Arabia universities: A literature review. Paper presented at the International conference on advanced in computing, Engineering and Learning Technologies.
- Alzahrani, A. I., Mahmud, I., Ramayah, T., Alfarraj, O., & Alalwan, N. (2017). Modelling digital library success using the DeLone and McLean information system success model. *Journal of Librarianship and Information Science*, 0961000617726123.
- Association, A. P. (1995). Learner-centered psychological principles: A framework for school redesign and reform: ERIC Clearinghouse.
- Aziz, R., & Shahzad, B. (2015). Factors for Measurement of ITES Quality for Higher Education Institutions in Saudi Arabia. *Global journal of computer science and technology*.
- Aziz, R., & Shahzad, B. (2016). Quality of IT Enabled Services in Higher Education Insti-Tutions in Saudi Arabia. *Global journal of computer science and technology*, 16(4).
- Badwelan, A., Drew, S., & Bahaddad, A. A. (2016). Towards acceptance m-learning approach in higher education in Saudi Arabia. *International Journal of Business and Management*, 11(8), 12.
- Bahaj, S., Aljaaidi, K., & Ahmed, T. (2019). Using TAM model to empirically examine students' attitudes towards e-services in college of business administration. *Management Science Letters*, 9(5), 651-660.
- Bahry, F. D. S., Anwar, N., & Amran, N. (2012). Predicting intended to use of web portal using extended technology acceptance model (TAM): Some perspective on information management students. Paper presented at the Business, Engineering and Industrial Applications (ISBEIA), 2012 IEEE Symposium on.



- Bairamzadeh, S., & Bolhari, A. (2010). Investigating factors affecting students' satisfaction of university websites. Paper presented at the Computer Science and Information Technology (ICCSIT), 2010 3rd IEEE International Conference on.
- Bajec, M. (2005a). Educational Portals: A Way to Get an Integrated. Web portals: the new gateways to Internet information and services, 252.
- Bajec, M. (2005b). Educational Portals: A Way to Get an Integrated, User-Centric University Information System Web portals: the new gateways to Internet information and services (pp. 252-269): IGI Global.
- Bandura, A. (1986). Social foundations of thought and action: A social cognitive perspective. Englewood Cliffs, NJ: Princeton-Hall.
- Bandura, A., & Wessels, S. (1997). Self-efficacy: W.H. Freeman & Company.
- Barati, A., Moradi, P., Ahmadi, B. and Azizpour, P. (2014). A study of the models for adoption of e-tax returns from the perspective of taxpayers. *Indian Journal of Fundamental and Applied Life Sciences*, Vol. 4(No. S1), pp.1923–1939.
- Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human relations*, 61(8), 1139-1160.
- Benaida, M., Namoun, A., & Taleb, A. (2018). Evaluation of the Impact of Usability in Arabic University Websites: Comparison between Saudi Arabia and the UK. *INTERNATIONAL JOURNAL OF ADVANCED COMPUTER SCIENCE AND APPLICATIONS*, 9(8), 365-375.
- Benlian, A. (2015). Web personalization cues and their differential effects on user assessments of website value. *Journal of management information systems*, 32(1), 225-260.
- Bettman, J. R., Payne, J. W., & Staelin, R. (1986). Cognitive considerations in designing effective labels for presenting risk information. *Journal of Public Policy & Marketing*, 5(1), 1-28.
- Boateng, H., Adam, D. R., Okoe, A. F., & Anning-Dorson, T. (2016). Assessing the determinants of internet banking adoption intentions: A social cognitive theory perspective. *Computers in Human Behavior*, 65, 468-478.
- Bolliger, D. U., & Martindale, T. (2004). Key factors for determining student satisfaction in online courses. *International Journal on E-learning*, 3(1), 61-68.

- Bonk, C. J., & Cunningham, D. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. *Electronic collaborators: Learner-centered technologies for literacy, apprenticeship, and discourse*, 25, 25-50.
- Booi, V. M., & Ditsa, G. E. (2013). Usability and user acceptance of university web portal interfaces: a case of South African universities. Paper presented at the International Conference on Human-Computer Interaction.
- Boudreau, M.-C., Gefen, D., & Straub, D. W. (2001). Validation in information systems research: a state-of-the-art assessment. *MIS quarterly*, 1-16.
- Boyle, R., & Ruppel, C. (2004). On-line purchasing intent: the effect of personal innovativeness, perceived risk, and computer self-efficacy. Paper presented at the Proceedings of the 7 th annual conference of the Southern Association for Information Systems (SAIS).
- Bringula, R. P. (2013). Influence of faculty-and web portal design-related factors on web portal usability: A hierarchical regression analysis. *Computers & Education*, 68, 187-198.
- Bringula, R. P. (2016). Factors Affecting Web Portal Information Services Usability: A Canonical Correlation Analysis. *International Journal of Human-Computer Interaction*, 32(10), 814-826.
- Bringula, R. P., Sarmiento, J. J. M., & Basa, R. S. (2017). Computer Self-efficacy and Its Relationship with Web Portal Usage: Evidence from the University of the East. arXiv preprint arXiv:1707.02435.
- Brown, I. T. (2002). Individual and technological factors affecting perceived ease of use of web-based learning technologies in a developing country. *The Electronic Journal of Information Systems in Developing Countries*, 9.
- Bryman, A. (2016). *Social research methods*: Oxford university press.
- Byrne, B. M. (2010). *Multivariate applications series. Structural equation modeling with AMOS: Basic concepts, applications, and programming*: Routledge/Taylor & Francis Group New York.
- Cebi, S. (2013). A quality evaluation model for the design quality of online shopping websites. *Electronic Commerce Research and Applications*, 12(2), 124-135.

- Chamba-Eras, L., Jacome-Galarza, L., Guaman-Quinche, R., Coronel-Romero, E., & Labanda-Jaramillo, M. (2017). Analysis of usability of universities Web portals using the Prometheus tool-SIRIUS. Paper presented at the eDemocracy & eGovernment (ICEDEG), 2017 Fourth International Conference on.
- Chan, S. C. (2001). Understanding adoption and continual usage behaviour towards Internet banking services in Hong Kong.
- Chang, S. C., & Tung, F. C. (2008). An empirical investigation of students' behavioural intentions to use the online learning course websites. *British Journal of Educational Technology*, 39(1), 71-83.
- Chen, Y.-H., & Chengalur-Smith, I. (2015). Factors influencing students' use of a library Web portal: Applying course-integrated information literacy instruction as an intervention. *The Internet and Higher Education*, 26, 42-55.
- Chukwuemeka, O. (2013). Environmental influence on academic performance of secondary school students in Port Harcourt Local Government Area of Rivers State. *Journal of Economics and Sustainable Development*, 4(12), 34-38.
- Cigdem, H., & Topcu, A. (2015). Predictors of instructors' behavioral intention to use learning management system: A Turkish vocational college example. *Computers in Human Behavior*, 52, 22-28.
- Cobus, L., Dent, V. F., & Ondrusek, A. (2005). How twenty-eight users helped redesign an academic library web site: A usability study. *Reference & user services quarterly*, 232-246.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, N.J.: L. Erlbaum Associates.
- Collis, J., & Hussey, R. (2013). *Business research: A practical guide for undergraduate and postgraduate students*: Macmillan International Higher Education.
- Compeau, D., Higgins, C. A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS quarterly*, 145-158.
- Compeau, D. R., & Higgins, C. A. (1995a). Application of social cognitive theory to training for computer skills. *Information systems research*, 6(2), 118-143.
- Compeau, D. R., & Higgins, C. A. (1995b). Computer self-efficacy: Development of a measure and initial test. *MIS quarterly*, 189-211.

- Creswell, J. W. (2008). *Qualitative, Quantitative, and mixed methods approaches*.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*: Sage publications.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, 35(8), 982-1003.
- De Luca, V., Epicoco, I., Lezzi, D., & Aloisio, G. (2011). A Web API Framework for Developing Grid Portals. *Procedia Computer Science*, 4, 392-401.
- DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information systems research*, 3(1), 60-95.
- Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, 19(4), 9-30.
- Diamantopoulos, A. (2006). The error term in formative measurement models: interpretation and modeling implications. *Journal of Modelling in Management*, 1(1), 7-17.
- Duncan, A. S. P., & Durrant, F. (2015). An assessment of the usability of the University of the West Indies (Mona, Jamaica) Main Library's website. *The Electronic Library*, 33(3), 590-599.
- Elsayed, A. M. (2016). Web content strategy in higher education institutions: the case of King Abdulaziz University. *Information Development*, 0266666916671387.
- F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review*, 26(2), 106-121.
- Gatchalian, M. M. (1999). Quality assessment through statistically-based sensory evaluation methods. *The TQM Magazine*, 11(6), 389-396.
- Gleason, B. W. (2000). Boston College university-wide information portal: Concepts and recommended course of action. *JA-SIG Portal Framework Project White Paper*.
- Gong, M., Xu, Y., & Yu, Y. (2004). An enhanced technology acceptance model for web-based learning. *Journal of Information Systems Education*, 15(4).

- Gul, H., & Saqib, M. (2015). Usability Evaluation of an Educational Website in Saudi Arabia. *VAWKUM Transactions on Computer Sciences*, 8(2), 1-9.
- Gunawardena, C., & Zittle, R. (1998). Faculty development programmes in distance education in American higher education. Staff development in open and flexible learning, 105-114.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.
- Haliso, Y. (2011). *Factors Affecting Information and Communication Technologies (ICTs) Use by Academic Librarians in Southwestern Nigeria (Vol. 2011)*.
- Hassan, Y. F. (2013). Cellular Automata For Adaptive Web Portal Structure In Egyptian Universities. *International Journal of Engineering Sciences & Emerging Technologies*, 6(2), 133-141.
- Henry, J. W., & Stone, R. W. (1994). A structural equation model of end-user satisfaction with a computer-based medical information system. *Information Resources Management Journal (IRMJ)*, 7(3), 21-33.
- Hidayanto, A. N., Purwandari, B., Kartika, D., & Kosandi, M. (2017). Factors influencing citizen's intention to participate electronically: The perspectives of social cognitive theory and e-government service quality. Paper presented at the 2017 International Conference on Advanced Computer Science and Information Systems (ICACISIS).
- Hu, C.-P., Hu, Y., & Yan, W.-W. (2014). An empirical study of factors influencing user perception of university digital libraries in China. *Library & Information Science Research*, 36(3), 225-233.
- Huang, J.-H., & Yang, T.-K. (2011). The impacts of homepage screen density on website evaluations: The moderating role of personality type. *Social Behavior and Personality: an international journal*, 39(3), 381-390.
- Hussein, R. (2005). *The Contribution of Organizational, Technological and Individual Factors on Information System Success in the Malaysian Public Sector*. Universiti Putra Malaysia.
- Hwang, Y., & Yi, M. (2002). Predicting the use of web-based information systems: intrinsic motivation and self-efficacy. *AMCIS 2002 Proceedings*, 149.

- Iqbal, M., & Warraich, N. F. (2016). Usability evaluation of an academic library website: A case of the University of the Punjab. *Pakistan Journal of Information Management & Libraries (PJIM&L)*, 13.
- Jeon, M. M., & Jeong, M. (2016). Influence of website quality on customer perceived service quality of a lodging website. *Journal of Quality Assurance in Hospitality & Tourism*, 17(4), 453-470.
- Jiménez-Barreto, J., & Campo-Martínez, S. (2018). Destination website quality, users' attitudes and the willingness to participate in online co-creation experiences. *European Journal of Management and Business Economics*, 27(1), 26-41.
- Johnson, D. M., Lester, M. L., & Ferguson, J. A. (2001). Analysis of the relationships between computer experiences, self-efficacy, and knowledge of undergraduate students entering a land-grant college of agriculture. Paper presented at the 28th Annual National Agricultural Education Research Conference.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), 14-26.
- Jong, D., & Wang, T.-S. (2009). Student acceptance of web-based learning system. Paper presented at the Proceedings. The 2009 International Symposium on Web Information Systems and Applications (WISA 2009).
- Kang, Y. S., & Lee, H. (2010). Understanding the role of an IT artifact in online service continuance: An extended perspective of user satisfaction. *Computers in Human Behavior*, 26(3), 353-364.
- Katsanos, C., Tselios, N., & Avouris, N. (2010). A survey of tools supporting design and evaluation of websites based on models of human information interaction. *International Journal on Artificial Intelligence Tools*, 19(06), 755-781.
- Khwaldeh, S. M., Al-Hadid, I., & Masa'deh, R. e. (2017). The Association between E-Services Web Portals Information Quality and ICT Competence in the Jordanian Universities. *Asian Social Science*, 13(3), 156.
- Kosinski, M., Bachrach, Y., Kohli, P., Stillwell, D., & Graepel, T. (2014). Manifestations of user personality in website choice and behaviour on online social networks. *Machine learning*, 95(3), 357-380.
- Kotler, P., & Keller, K. (2012). *Marketing Management*: Pearson, Prentice Hall, Upper Sadle River. New Jersey.

- Kotrlik, J., & Higgins, C. (2001). Organizational research: Determining appropriate sample size in survey research appropriate sample size in survey research. *Information technology, learning, and performance journal*, 19(1), 43.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 30(3), 607-610. doi:10.1177/001316447003000308
- Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*: Sage Publications Limited.
- Kuo, F.-Y., Chu, T.-H., Hsu, M.-H., & Hsieh, H.-S. (2004). An investigation of effort-accuracy trade-off and the impact of self-efficacy on Web searching behaviors. *Decision support systems*, 37(3), 331-342.
- Kurniawan, S. H., Ellis, R. D., & Allaire, J. C. (2002). The impact of web self-efficacy, age, and web experience on bookmark manipulation. *Universal Access in the Information Society*, 1(3), 207-216.
- Lee, J.-W. (2010). Online support service quality, online learning acceptance, and student satisfaction. *The Internet and Higher Education*, 13(4), 277-283. doi:http://dx.doi.org/10.1016/j.iheduc.2010.08.002
- Lee, S. (2012). Academic library e-service user motivation: A Korean case study. *Libri*, 62(3), 233-247.
- Lee, Y., & Kwon, O. (2009). Can affective factors contribute to explain continuance intention of web-based services? Paper presented at the Proceedings of the 11th International Conference on Electronic Commerce.
- Li, C. Y., Asimiran, S., & Suyitno, S. (2018). Students' Expectations and Perceptions on Service Quality of E-Learning in a Selected Faculty of a Public University in Malaysia. Paper presented at the 3rd International Conference on Educational Management and Administration (CoEMA 2018).
- Liaw, S.-S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. *Computers & Education*, 51(2), 864-873.
- Liaw, S.-S., Chang, W.-C., Hung, W.-H., & Huang, H.-M. (2006). Attitudes toward search engines as a learning assisted tool: approach of Liaw and Huang's research model. *Computers in Human Behavior*, 22(2), 177-190.

- Lin, C.-P. (2010). Learning virtual community loyalty behavior from a perspective of social cognitive theory. *International Journal of Human-Computer Interaction*, 26(4), 345-360.
- Liu, C., & Arnett, K. P. (2000). Exploring the factors associated with Web site success in the context of electronic commerce. *Information & Management*, 38(1), 23-33.
- Longinidis, P., & Gotzamani, K. (2009). ERP user satisfaction issues: insights from a Greek industrial giant. *Industrial Management & Data Systems*, 109(5), 628-645.
- Lowry, P. B., & Gaskin, J. (2014). Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *IEEE transactions on professional communication*, 57(2), 123-146.
- Luo, H., Han, X., & Yu, Y. (2016). The impact of website quality on user loyalty through perceived value and commitment. Paper presented at the 2016 13th International Conference on Service Systems and Service Management (ICSSSM).
- Luo, J., Ba, S., & Zhang, H. (2012). The effectiveness of online shopping characteristics and well-designed websites on satisfaction. *MIS quarterly*, 1131-1144.
- MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS quarterly*, 35(2), 293-334.
- Maedche, A., Staab, S., Stojanovic, N., Studer, R., & Sure, Y. (2003). Semantic portal-the seal approach. *Spinning the Semantic Web*, 317-359.
- Mahmood, M. A., Hall, L., & Swanberg, D. L. (2001). Factors affecting information technology usage: A meta-analysis of the empirical literature. *Journal of Organizational Computing and Electronic Commerce*, 11(2), 107-130.
- Maldonado, U. P. T., Khan, G. F., Moon, J., & Rho, J. J. (2009). E-learning motivation, students' acceptance/use of educational portal in developing countries: a case study of Peru. Paper presented at the Computer Sciences and Convergence Information Technology, 2009. ICCIT'09. Fourth International Conference on.



- Mane, M. B., & Panage, B. (2015). Use of Jayakar Library Portal: A Survey of Savitribai Phule Pune University. *International Research: Journal of Library and Information Science*, 5(2).
- Mansourvar, M., & Yasin, N. B. M. (2014). Development of a job web portal to improve education quality. *International Journal of Computer Theory and Engineering*, 6(1), 43.
- Mansourvar, M., & Yasin, N. M. (2010). Web portal as a knowledge management system in the universities. *World Academy of Science, Engineering and Technology*, 70, 968-974.
- McKinney, V., Yoon, K., & Zahedi, F. M. (2002). The measurement of web-customer satisfaction: An expectation and disconfirmation approach. *Information systems research*, 13(3), 296-315.
- Mentes, S. A., & Turan, A. H. (2012). Assessing the usability of university websites: an empirical study on Namik Kemal University. *TOJET: The Turkish Online Journal of Educational Technology*, 11(3).
- Mun, Y. Y., & Hwang, Y. (2003). Predicting the use of web-based information systems: self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *International Journal of human-computer studies*, 59(4), 431-449.
- Nasirun, N., Noor, S. M., Nor, Z. M., Ahmat, H., & Ahmad, Z. (2012). Perceived Web Service Quality for Students' Portal in Higher Learning Institution. *International Proceedings of Economics Development and Research*, 56, 52.
- Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*: Sage Publications.
- Noorman bin Masrek, M. (2007). Measuring campus portal effectiveness and the contributing factors. *Campus-Wide Information Systems*, 24(5), 342-354.
- Odeh, R., Oguiche, O., Angelina, E. I., & Dondo, E. (2015). Influence Of School Environment On Academic Achievement Of Students In Secondary Schools In Zone "A" Senatorial District Of Benue State, Nigeria. *International journal of recent scientific research*, 6(7), 4914-4922.
- Ofoegbu, E., Fayemiwo, M., Omisore, M., & Olanrewaju, P. (2014). A Web Portal Architectural Design and Implementation for Private Universities in Nigeria.

- Oliha, F. (2014). Web portal usability among Nigerian university students: A case study of University of Benin, Nigeria. *Nigerian Journal of Technology*, 33(2), 199-206.
- Ong, M. H. A., & Puteh, F. (2017). Quantitative Data Analysis: Choosing Between SPSS, PLS, and AMOS in Social Science Research. *International Interdisciplinary Journal of Scientific Research*, 3(1), 14-25.
- Orlikowski, W. J., & Baroudi, J. J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information systems research*, 2(1), 1-28.
- Otubelu, N. J. (2011). E-learning through digital libraries: The case of National Open University of Nigeria.
- Parboteeah, D. V., Valacich, J. S., & Wells, J. D. (2009). The influence of website characteristics on a consumer's urge to buy impulsively. *Information systems research*, 20(1), 60-78.
- Pearson, J. M., & Pearson, A. M. (2008). An exploratory study into determining the relative importance of key criteria in web usability: a multi-criteria approach. *Journal of Computer Information Systems*, 48(4), 115-127.
- Pengnate, S. F., & Sarathy, R. (2017). An experimental investigation of the influence of website emotional design features on trust in unfamiliar online vendors. *Computers in Human Behavior*, 67, 49-60.
- Percia, V., & Pamulaklakin, R. L. (2015). LEARNERS' SATISFACTION LEVEL WITH ONLINE STUDENT PORTAL AS A SUPPORT SYSTEM IN AN OPEN AND DISTANCE eLEARNING ENVIRONMENT (ODEL). *Turkish Online Journal of Distance Education*.
- Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European journal of information systems*, 17(3), 236-263.
- Pickett, R. A., & Hamre, W. B. (2002). Building portals for higher education. *New Directions for Institutional Research*, 2002(113), 37-56.
- Ping, Z. (2001). Important design features in different Web site domains. *e-Service Journal*, 1, 77.

- Polit, D. F., & Beck, C. T. (2006). The content validity index: are you sure you know what's being reported? Critique and recommendations. *Research in nursing & health*, 29(5), 489-497.
- QSRanking. (2019). QS World University Rankings. Retrieved from <https://www.topuniversities.com/university-rankings/world-university-rankings/2019>
- Rana, N. P., & Dwivedi, Y. K. (2015). Citizen's adoption of an e-government system: Validating extended social cognitive theory (SCT). *Government Information Quarterly*, 32(2), 172-181.
- Ringle, C., Wende, S., & Becker, J. (2015). *SmartPLS 3: SmartPLS GmbH*. Bönningstedt, Germany.
- Roca, J. C., Chiu, C.-M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. *International Journal of human-computer studies*, 64(8), 683-696.
- Roy, S., Pattnaik, P. K., & Mall, R. (2017). Quality assurance of academic websites using usability testing: an experimental study with AHP. *International Journal of System Assurance Engineering and Management*, 8(1), 1-11.
- Rozali, N. B. N., & Said, M. Y. B. (2015). Usability testing on government agencies web portal: a study on ministry of education Malaysia (MOE) web portal. Paper presented at the Software Engineering Conference (MySEC), 2015 9th Malaysian.
- sacm. (2017). Educational System in Saudi Arabia. Retrieved from <http://www.sacm.org/Education.aspx>
- Sale, J. E., Lohfeld, L. H., & Brazil, K. (2002). Revisiting the quantitative-qualitative debate: Implications for mixed-methods research. *Quality and quantity*, 36(1), 43-53.
- Schaupp, L. C. (2010). Web site success: Antecedents of web site satisfaction and re-use. *Journal of Internet Commerce*, 9(1), 42-64.
- Sehgal, V. K., Jagtiani, A., Shah, M., Sharma, A., Jaiswal, A., & Mehta, D. (2013). Job Portal-A Web Application for Geographically Distributed Multiple Clients. Paper presented at the Artificial Intelligence, Modelling and Simulation (AIMS), 2013 1st International Conference on.

- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*: John Wiley & Sons.
- Shah, R., Tanwar, A., Shah, M., & Pandey, S. (2017). *Online College Portal*.
- Shaltoni, A. M., Khraim, H., Abuhamad, A., & Amer, M. (2015). Exploring students' satisfaction with universities' portals in developing countries: A cultural perspective. *The International Journal of Information and Learning Technology*, 32(2), 82-93.
- Sindhuja, P., & Dastidar, S. G. (2009). Impact of the factors influencing website usability on user satisfaction. *IUP Journal of Management Research*, 8(12).
- Stokes, T. A., Gillan, D. J., & Braden, J. P. (2016). *Establishing the Link Between Usability and Student Satisfaction in Adaptive Online Learning*. Paper presented at the Proceedings of the Human Factors and Ergonomics Society Annual Meeting.
- Sung, E., & Mayer, R. E. (2012). Affective impact of navigational and signaling aids to e-learning. *Computers in Human Behavior*, 28(2), 473-483.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5): Pearson Boston, MA.
- Tang, S.-M. (2000). An impact factor model of Intranet adoption: an exploratory and empirical research. *Journal of Systems and Software*, 51(3), 157-173.
- Tatnall, A. (2005). *Web portals: the new gateways to Internet information and services*: IGI Global.
- Tella, A., & Bashorun, M. (2012). UNDERGRADUATE STUDENTS' SATISFACTION WITH THE USE OF WEB PORTALS. *International Journal of Web Portals (IJWP)*, 4(2), 56-73.
- Teo, T. (2009). The impact of subjective norm and facilitating conditions on pre-service teachers' attitude toward computer use: A structural equation modeling of an extended technology acceptance model. *Journal of Educational Computing Research*, 40(1), 89-109.
- Teoh, W., Tan, S.-C., & Chong, S. C. (2013). Factors influencing perceptions of university students towards internet recruitment. *Asian Academy of Management Journal*, 18(1), 123-142.

- Thomas-Alvarez, N., & Mahdjoubi, L. (2013). Testing the effectiveness of a web-based portal system for the building control sector. *Automation in construction*, 29, 196-204.
- Thuseethan, S., Achchuthan, S., & Kuhanesan, S. (2014). Usability evaluation of learning management systems in Sri Lankan universities. arXiv preprint arXiv:1412.0197.
- TimeHigherEducation. (2019). Times Higher Education ranking. Retrieved from <https://www.timeshighereducation.com/world-university-rankings>
- Tolentino, M. N. (2011). University web portals as information management tool: Technology acceptance dimension. *International Journal of Management and Information Systems*, 15(3), 31-40.
- Treiblmaier, H., & Filzmoser, P. (2011). Benefits from using continuous rating scales in online survey research.
- Trochim, W., Donnelly, J. P., & Arora, K. (2015). *Research methods: The essential knowledge base*. Boston, MA: Cengage.
- Tucker, B., Halloran, P., & Price, C. (2013). Student perceptions of the teaching in online learning: and Australian university case study. *Research and development in Higher Education: The place of learning and teaching*, 470-484.
- Turner, M., Kitchenham, B., Brereton, P., Charters, S., & Budgen, D. (2010). Does the technology acceptance model predict actual use? A systematic literature review. *Information and Software Technology*, 52(5), 463-479.
- Umukoro, I. O., & Tihamiyu, M. A. (2016). Determinants of e-library services' use among university students: A study of John Harris Library, University of Benin, Nigeria. *Journal of Librarianship and Information Science*, 0961000616653176.
- Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *Journal of Information technology theory and application*, 11(2), 5-40.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, 46(2), 186-204.

- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- Verbree, M., Horlings, E., Groenewegen, P., Van der Weijden, I., & Van den Besselaar, P. (2015). Organizational factors influencing scholarly performance: a multivariate study of biomedical research groups. *Scientometrics*, 102(1), 25-49.
- Wang, S. L., & Lin, S. S. (2007). The application of social cognitive theory to web-based learning through NetPorts. *British Journal of Educational Technology*, 38(4), 600-612.
- Warshaw, P. R., & Davis, F. D. (1985). Disentangling behavioral intention and behavioral expectation. *Journal of experimental social psychology*, 21(3), 213-228.
- Wells, J. D., Valacich, J. S., & Hess, T. J. (2011). What signal are you sending? How website quality influences perceptions of product quality and purchase intentions. *MIS quarterly*, 373-396.
- Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information systems research*, 16(1), 85-102.
- Wu, J.-H., Tennyson, R. D., & Hsia, T.-L. (2010). A study of student satisfaction in a blended e-learning system environment. *Computers & Education*, 55(1), 155-164.
- Wu, M.-Y., Chou, H.-P., Weng, Y.-C., & Huang, Y.-H. (2011). TAM-2 based study of website user behavior-using web 2.0 websites as an example. *WSEAS Transactions on Business and Economics*, 4(8), 133-151.
- Yang, Z., Cai, S., Zhou, Z., & Zhou, N. (2005). Development and validation of an instrument to measure user perceived service quality of information presenting web portals. *Information & Management*, 42(4), 575-589.
- Young, L.-Y. (2001). Factors affecting user satisfaction on Intranet. Unpublished Master's thesis, National Sun Yat-Sen University, Kaohsiung, available at: [www.etsd.lib.nsysu.edu.tw/ETD-db/ETD-search/view\\_etd](http://www.etsd.lib.nsysu.edu.tw/ETD-db/ETD-search/view_etd).
- Zaied, A. N. H. (2012). An integrated success model for evaluating information system in public sectors. *Journal of Emerging Trends in Computing and Information Sciences*, 3(6), 814-825.

- Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi-Majd, H., & Nikanfar, A.-R. (2015). Design and implementation content validity study: development of an instrument for measuring patient-centered communication. *Journal of caring sciences*, 4(2), 165.
- Zhang, X., & Prybutok, V. R. (2005). A consumer perspective of e-service quality. *IEEE transactions on Engineering Management*, 52(4), 461-477.
- Zviran, M., Glezer, C., & Avni, I. (2006). User satisfaction from commercial web sites: The effect of design and use. *Information & Management*, 43(2), 157-178.