

EXTENDING THE TECHNOLOGY
ACCEPTANCE MODEL WITH KNOWLEDGE
MANAGEMENT FACTORS TO EXAMINE THE
ACCEPTANCE OF MOBILE LEARNING

MOSTAFA NADHIR HASSAN AL-EMRAN

DOCTOR OF PHILOSOPHY

UNIVERSITI MALAYSIA PAHANG



SUPERVISOR'S DECLARATION

We hereby declare that We have checked this thesis and in our opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Doctor of Philosophy.

(Supervisor's Signature)

Full Name : DR. VITALIY MEZHUYEV

Position : PROFESSOR

Date :

(Co-supervisor's Signature)

Full Name : DR. ADZHAR KAMALUDIN

Position : SENIOR LECTURER

Date :



STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

(Student's Signature)

Full Name : MOSTAFA NADHIR HASSAN AL-EMRAN

ID Number : PCC16021

Date :

EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL WITH KNOWLEDGE
MANAGEMENT FACTORS TO EXAMINE THE ACCEPTANCE OF MOBILE
LEARNING

MOSTAFA NADHIR HASSAN AL-EMRAN

Thesis submitted in fulfillment of the requirements
for the award of the degree of
Doctor of Philosophy

Faculty of Computer Systems & Software Engineering
UNIVERSITI MALAYSIA PAHANG

MARCH 2019

ACKNOWLEDGEMENTS

By the name of God, the Most Gracious, the Most Merciful. All praise be to Allah, the Creator, and the Master of the Universe.

First of all, I would like to express my deepest gratitude to my main supervisor Prof. Dr. Vitaliy Mezhuyev for his assistance, guidance, cooperation, flexible time, and continuous support during my PhD study at Universiti Malaysia Pahang. Thank you indeed!

I also would like to thank my Co-supervisor Dr. Adzhar Kamaludin for his assistance, guidance, and cooperation during my PhD study.

My highest appreciation also goes to the Dean, Assistant Deans, and all the lecturers and staff in the Faculty of Computer Systems & Software Engineering for providing all the facilities and encouraging the students to produce a high-quality research.

My special thanks and gratitude also go to my parents for their constant prayers and endless support during my whole life. Last but not the least, my gratitude is also extended to my life partner Noor Al-Qaysi and our lovely daughters for their cooperation, support, understanding, love, and patience.

ABSTRAK

Dalam era teknologi hari ini, pembelajaran mudah alih (M-pembelajaran) telah menjadi alat penting yang membolehkan pelajar mengakses bahan pembelajaran pada bila-bila masa dan di mana sahaja. Menentukan faktor-faktor yang mempengaruhi penerimaan M-pembelajaran masih menjadi salah satu isu kajian oleh para sarjana Sistem Maklumat (SM). Model Penerimaan Teknologi (MPT) telah menyaksikan banyak pengubahsuaian dan penambahbaikan, yang menyumbang kepada pengenalpastian faktor-faktor yang mempengaruhi penerimaan M-pembelajaran. Penggabungan MPT dengan faktor-faktor lain adalah cabang kajian bagi sarjana SM untuk terus meneliti penerimaan M-pembelajaran. Pengurusan Pengetahuan (PP) dianggap sebagai komponen penting untuk membangunkan sistem M-pembelajaran. Selain itu, faktor PP perlu dimasukkan ke dalam sistem M-pembelajaran untuk meningkatkan keupayaan pembelajaran pelajar. Kajian menunjukkan bahawa faktor PP (pemerolehan pengetahuan, perkongsian pengetahuan, aplikasi pengetahuan, dan perlindungan pengetahuan) mempunyai kesan yang selari terhadap penggunaan dan kejayaan SM. Walau bagaimanapun, kajian terlepas pandang akan kesan faktor PP kepada penerimaan M-pembelajaran. Selaras dengan isu ini, objektif penyelidikan ini telah dilipat gandakan. Pertama, untuk menganalisis persepsi pelajar terhadap gabungan faktor PP dalam sistem M-pembelajaran melalui kajian awal. Penyelidikan kami didorong oleh analisis hasil kajian awal, di mana 93% daripada pelajar menunjukkan bahawa mereka akan menggunakan sistem M-pembelajaran dalam kajian mereka jika faktor PP dipertimbangkan. Kedua, untuk membangunkan model baru dengan menggabungkan MPT dengan faktor PP sebagai pemboleh ubah luar. Oleh itu, dicadangkan bahawa dua teras pembinaan utama MPT (iaitu, kebergunaan dan kemudahan penggunaan) dipengaruhi oleh empat faktor PP. Tingkah laku untuk menggunakan sistem M-pembelajaran diandaikan dipengaruhi oleh dua pembinaan utama MPT, sedangkan tingkah laku itu sendiri mempengaruhi penggunaan sistem sebenar. Ketiga, untuk mengesahkan model yang dicadangkan melalui pengembangan aplikasi M-pembelajaran dan penggunaan metode analisis statistik. Kajian ini menggunakan Model Persamaan Sisi-Separuh Struktur (MPS-SS) untuk mengesahkan model yang dibangunkan. Data dikumpul melalui kaji selidik dari 735 pelajar siswazah IT di dua universiti yang berlainan di dua negara berlainan iaitu Universiti Malaysia Pahang (UMP) di Malaysia dan Kolej Universiti Al Buraimi (KUB) di Oman. Pemilihan kedua-dua sampel ini untuk mengesahkan model yang dibangunkan dalam suasana silang budaya. Hasil kajian menunjukkan bahawa pemerolehan, penggunaan, dan perlindungan pengetahuan mempunyai kesan positif ke atas kemudahan penggunaan dan kebergunaan sistem M-pembelajaran dalam kedua-dua sampel. Namun, perkongsian pengetahuan didapati disokong sebahagiannya dalam kedua-dua sampel. Tambahan pula, kebergunaan dan kemudahan penggunaan didapati penentu utama keinginan untuk menggunakan sistem M-pembelajaran. Lebih menarik lagi, model yang dibangunkan menerangkan varians besar (50%) dalam penggunaan sebenar sistem M-pembelajaran dalam kedua-dua sampel, yang dengan jelas menunjukkan bahawa model struktur yang dibangunkan adalah kukuh dan sah, oleh itu, ia dapat memberikan penjelasan akan penggunaan sebenar sistem M-pembelajaran. Hasil kajian ini menyumbang kepada penyelidikan sedia ada dengan mengesahkan dan memperluas MPT dengan faktor PP dalam dua konteks yang berbeza (iaitu, UMP dan KUB) dan memberikan pelbagai implikasi kepada teori, penyelidikan, dan amalan.

ABSTRACT

In today's technological era, Mobile learning (M-learning) has become an essential tool that enables the students to access the learning materials on anytime anywhere settings. Determining the factors that affect the acceptance of M-learning is still one of the ongoing and critical issues by Information System (IS) scholars. The Technology Acceptance Model (TAM) has witnessed a lot of modifications and enhancements, which in turn contribute to the identification of the factors that affect the M-learning acceptance. Extending the TAM with other factors is still an open door for IS scholars to further examine the M-learning acceptance. Additionally, Knowledge Management (KM) is regarded as an essential component for developing M-learning systems. Besides, it is crucial for enhancing the students' learning abilities that KM factors should be incorporated in M-learning systems. Research shows that KM factors (knowledge acquisition, knowledge sharing, knowledge application, and knowledge protection) have a significant effect on the adoption and success of many ISs. However, research has overlooked the impact of KM factors on M-learning acceptance. In line with this issue, the research objectives of this study are threefold. First, to analyze the students' perceptions towards the integration of KM factors in M-learning systems through a preliminary study. Our research problem was motivated by the analysis of the preliminary study results, in which 93% of the students indicated that they would use the M-learning system in their studies if KM factors would be taken into consideration. Second, to develop a new model by extending the TAM with the KM factors as external variables. In that, it is suggested that the two main constructs of TAM (i.e., perceived usefulness and perceived ease of use) are affected by the four KM factors. Besides, the behavioral intention to use is suggested to be influenced by the two main constructs of TAM, whereas the behavioral intention itself is assumed to affect the actual system use. Third, to validate the proposed model through the development of M-learning application and the use of statistical analyses methods. This study employs the Partial Least Squares-Structural Equation Modeling (PLS-SEM) to validate the developed model. Data were collected through a questionnaire survey from 735 IT undergraduate students in two different universities in two different countries, namely Universiti Malaysia Pahang (UMP) in Malaysia and Al Buraimi University College (BUC) in Oman. The selection of these two samples is attributed to the intention to validate the developed model in a cross-cultural setting. The results suggest that knowledge acquisition, application, and protection have a positive effect on perceived ease of use and perceived usefulness of M-learning systems in both samples. However, knowledge sharing was found to be partially supported in both samples. Furthermore, perceived usefulness and perceived ease of use were found to be significant determinants of the behavioral intention to use M-learning systems. More interesting, the developed model explains a substantial variance (50%) in the actual use of M-learning systems in both samples, which clearly shows that the developed structural model is sound and valid, and hence, it could provide a plentiful explanation of the actual use of M-learning systems. The results of this study contribute to the existing literature by validating and extending the TAM with the KM factors in two different contexts (i.e., UMP and BUC) and provide various implications to the theory, research, and practice.

TABLE OF CONTENTS

DECLARATION	
TITLE PAGE	
ACKNOWLEDGEMENTS	ii
ABSTRAK	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xv
CHAPTER 1 INTRODUCTION	1
1.1 Background	1
1.2 Research Motivation	3
1.3 Problem Statement	5
1.4 Research Aim and Objectives	7
1.5 Research Scope	8
1.6 Significance of Research	8
1.7 Thesis Organization	10
CHAPTER 2 LITERATURE REVIEW	13
2.1 Introduction	13
2.2 Procedures for Conducting the Literature Review	14
2.2.1 Procedures for Conducting the First Systematic Literature Review	15

2.2.2	Procedures for Conducting the Second Systematic Literature Review	16
2.3	Mobile Learning and Technology Acceptance Model (TAM)	18
2.3.1	Background	18
2.3.2	TAM Origins	20
2.3.3	TAM Development and Extension	22
2.3.4	Advantages and Disadvantages of TAM	25
2.3.5	TAM Research in the M-Learning Context	25
2.3.6	TAM Constructs in the M-Learning Context	35
2.3.7	TAM and M-learning Studies Distribution across Various Perspectives	37
2.4	M-learning Applications Studies	46
2.5	Knowledge Management	49
2.5.1	Knowledge Management Overview	49
2.5.2	Knowledge Management Factors	50
2.5.3	Distribution of KM Factors Studies across Various Perspectives	54
2.6	Knowledge Management and M-Learning	63
2.7	Discussion	65
2.8	Conclusion	69
	CHAPTER 3 RESEARCH METHODOLOGY	71
3.1	Introduction	71
3.2	Research Design	72
3.3	Instrument Development and Measurement	74
3.4	Instrument Validation	74
3.4.1	Pre-testing	75
3.4.2	Pilot Study	75

3.5	Population	76
3.6	Sample Size	76
3.7	Sample Technique	77
3.8	Unit of Analysis	77
3.9	Data Collection and Ethical Procedures	77
3.10	Data Analysis	78
3.11	Descriptive Analysis	78
3.12	Reliability Analysis	79
3.13	Structural Equation Modelling (SEM)	79
3.14	Partial Least Squares (PLS)	80
3.15	Measurement and Structural Models Assessment	81
	3.15.1 Measurement Model Assessment	81
	3.15.2 Structural Model Assessment	83
CHAPTER 4 PRELIMINARY STUDY AND RESEARCH MODEL DEVELOPMENT		85
4.1	Introduction	85
4.2	Preliminary Study	86
	4.2.1 Research Instrument	86
	4.2.2 Pilot Test	87
	4.2.3 Participants	88
	4.2.4 Measurement	88
	4.2.5 Data Analysis	89
	4.2.6 Results and Discussion	89
4.3	Research Model Development	95
	4.3.1 Research Hypotheses	97
	4.3.2 Research Model	103

4.4	Summary	105
CHAPTER 5 RESULTS AND DISCUSSION		107
5.1	Introduction	107
5.2	M-learning Application Development	108
5.2.1	M-learning Application Architecture	108
5.2.2	Use Case Diagram	109
5.2.3	Development	110
5.2.4	Implementation	113
5.2.5	M-learning Application Discussion	114
5.3	Data Examination and Preparation for Analysis	115
5.3.1	Sample Size	115
5.3.2	Missing Data	116
5.3.3	Suspicious Response Patterns	116
5.3.4	Outliers	116
5.3.5	Normality Assessment	117
5.3.6	Multicollinearity	118
5.3.7	Common Method Bias Analysis	118
5.4	Participants' Characteristics	119
5.5	Descriptive Statistics for Constructs' Items	121
5.5.1	Knowledge Acquisition (KA)	121
5.5.2	Knowledge Sharing (KS)	122
5.5.3	Knowledge Application (KAP)	122
5.5.4	Knowledge Protection (KP)	123
5.5.5	Perceived Usefulness (PU)	123
5.5.6	Perceived Ease of Use (PEOU)	124

5.5.7	Behavioral Intention to Use (BI)	124
5.5.8	Actual System Use (AU)	125
5.6	Similarities and Differences between UMP and BUC Samples	125
5.7	Reliability Test	127
5.8	Measurement Model Assessment	127
5.8.1	Convergent Validity	128
5.8.2	Discriminant Validity	131
5.9	Structural Model Assessment	137
5.10	Discussion	146
5.10.1	The Impact of Knowledge Acquisition on Perceived Usefulness and Perceived Ease of Use	146
5.10.2	The Influence of Knowledge Acquisition on Knowledge Sharing	147
5.10.3	The Impact of Knowledge Sharing on Knowledge Application	147
5.10.4	The Effect of Knowledge Sharing on Perceived Usefulness and Perceived Ease of Use	147
5.10.5	The Influence of Knowledge Application on Perceived Usefulness and Perceived Ease of Use	149
5.10.6	The Impact of Knowledge Protection on Perceived Usefulness and Perceived Ease of Use	149
5.10.7	The Effect of Perceived Ease of Use on Perceived Usefulness	150
5.10.8	The Influence of Perceived Usefulness and Perceived Ease of Use on the Behavioral Intention to Use	150
5.10.9	The Impact of the Behavioral Intention to Use on the Actual System Use	151
5.11	Summary	152
CHAPTER 6 CONCLUSION AND FUTURE RESEARCH		155
6.1	Introduction	155

6.2	Summary of the Findings	155
6.2.1	Objective One: To Analyse the Students' Perceptions towards the Integration of KM Factors in M-learning Systems	156
6.2.2	Objective Two: To Develop a New Model by Extending the TAM with the KM Factors as External Variables	157
6.2.3	Objective Three: To Validate the Proposed Model through the Development of M-learning Application and the Use of Statistical Analyses Methods	157
6.3	Contributions of the Study	160
6.3.1	Contribution to Theory and Research	160
6.3.2	Implication to Practice	161
6.4	Limitations	162
6.5	Directions for Future Research	163
	REFERENCES	165
	APPENDIX A EXTENDED TABLES FROM THE LITERATURE REVIEW	188
	APPENDIX B QUESTIONNAIRE SURVEY	203
	APPENDIX C ENROLLED STUDENTS' STATISTICS	207
	APPENDIX D PRELIMINARY STUDY SURVEY	209
	APPENDIX E UNIVARIATE AND MULTIVARIATE OUTLIERS	211
	APPENDIX F NORMALITY TEST	214
	APPENDIX G MULTICOLLINEARITY RESULTS	216
	APPENDIX H COMMON METHOD BIAS RESULTS	218
	LIST OF PUBLICATIONS	220

LIST OF TABLES

Table 2.1	Inclusion and exclusion criteria for M-learning and TAM studies	15
Table 2.2	Total number of articles after removing the duplicates	16
Table 2.3	Inclusion and exclusion criteria for KM factors studies	17
Table 2.4	Analysis of TAM research papers in terms of external variables in M-learning context	28
Table 2.5	Most frequent external factors affecting M-learning acceptance	29
Table 2.6	Analysis of TAM research papers in terms of factors from other theories/models in M-learning context	31
Table 2.7	Most frequent factors adopted from other theories/models	32
Table 2.8	Analysis of TAM research papers in terms of contextual factors in M-learning context	33
Table 2.9	M-learning applications studies	47
Table 2.10	Analysis of studies related to the impact of KM factors on various ISs	56
Table 2.11	Most frequent KM factors affecting information systems	57
Table 3.1	KM factors and their sources	74
Table 3.2	TAM constructs and their sources	74
Table 3.3	Reliability analysis for the pilot study	76
Table 4.1	KM factors and their corresponding items and sources	87
Table 4.2	Students' personal information	88
Table 4.3	Results of students' usage of mobile devices and M-learning systems	91
Table 4.4	Results of students' perceptions towards the integration of KM factors in M-learning systems	93
Table 4.5	Interview questions results	95
Table 5.1	Demographic profile of the respondents	119
Table 5.2	Students' usage of mobile technology	121
Table 5.3	Descriptive statistics for knowledge acquisition construct	122
Table 5.4	Descriptive statistics for knowledge sharing construct	122
Table 5.5	Descriptive statistics for knowledge application construct	123
Table 5.6	Descriptive statistics for knowledge protection construct	123
Table 5.7	Descriptive statistics for perceived usefulness construct	124
Table 5.8	Descriptive statistics for perceived ease of use construct	124
Table 5.9	Descriptive statistics for behavioral intention to use construct	125
Table 5.10	Descriptive statistics for actual system use construct	125

Table 5.11	Mean and t-test for all constructs	126
Table 5.12	Cronbach's Alpha for the UMP and BUC samples	127
Table 5.13	Convergent validity results for UMP sample	129
Table 5.14	Convergent validity results for BUC sample	130
Table 5.15	Fornell-Larcker scale for UMP sample	132
Table 5.16	Fornell-Larcker scale for BUC sample	132
Table 5.17	Cross Loadings for UMP sample	133
Table 5.18	Cross Loadings for BUC sample	134
Table 5.19	Heterotrait-Monotrait Ratio (HTMT) for UMP sample	135
Table 5.20	Heterotrait-Monotrait Ratio (HTMT) for BUC sample	135
Table 5.21	Hypotheses testing results for UMP sample	138
Table 5.22	Hypotheses testing results for BUC sample	138
Table 5.23	The indirect effects for predicting the actual system use (UMP sample)	142
Table 5.24	The indirect effects for predicting the actual system use (BUC sample)	142
Table 5.25	R ² values for both samples	143
Table 5.26	f ² values for UMP sample	145
Table 5.27	f ² values for BUC sample	145
Table 5.28	Q ² values for both samples	146
Table 5.29	Hypotheses testing results for both samples	154

LIST OF FIGURES

Figure 2.1	Systematic review process for M-learning and TAM studies	16
Figure 2.2	Systematic review process for KM factors studies	18
Figure 2.3	Simplified TAM model	22
Figure 2.4	TAM model	23
Figure 2.5	TAM 2 model	24
Figure 2.6	A possible extension to the TAM Model	25
Figure 2.7	TAM's four groups of modifications	26
Figure 2.8	Distribution of studies based on TAM progress	38
Figure 2.9	Distribution of studies in terms of research methods	39
Figure 2.10	Distribution of studies in terms of country	41
Figure 2.11	Distribution of studies in terms of context/discipline	43
Figure 2.12	Distribution of studies in terms of educational level	44
Figure 2.13	Distribution of studies in terms of publication year	45
Figure 2.14	Distribution of studies by TAM progress and publication year	46
Figure 2.15	Knowledge Management Factors	51
Figure 2.16	Distribution of studies in terms of research methods	58
Figure 2.17	Distribution of studies in terms of research outcomes	59
Figure 2.18	Distribution of studies in terms of research methods and outcomes	59
Figure 2.19	Distribution of studies in terms of information systems types	60
Figure 2.20	Distribution of studies in terms of participants	61
Figure 2.21	Distribution of studies in terms of country of implementation	62
Figure 2.22	Distribution of studies in terms of country of implementation and research outcomes	62
Figure 2.23	Distribution of studies in terms of publication year	63
Figure 3.1	Research Methodology Flowchart	72
Figure 4.1	Research model development flowchart	97
Figure 4.2	The developed Model	105
Figure 5.1	M-learning application architecture based on KM factors	109
Figure 5.2	Use case diagram	110
Figure 5.3	Sign up process	111
Figure 5.4	An example of some registered courses	112
Figure 5.5	An example of a course protected by a password	112
Figure 5.6	An example of discussions, messages, and learning materials sharing	113

Figure 5.7	An example of storing the course material into the application	113
Figure 5.8	Measurement Model for UMP sample	136
Figure 5.9	Measurement Model for BUC sample	137
Figure 5.10	Bootstrapping results for UMP sample	141
Figure 5.11	Bootstrapping results for BUC sample	142

LIST OF ABBREVIATIONS

AU	Actual System Use
AVE	Average Variance Extracted
BI	Behavioral Intention to Use
BUC	Al Buraimi University College
CB-SEM	Covariance-based Structural Equation Modelling
CLT	Cognitive Load Theory
CMB	Common Method Bias
CR	Composite Reliability
CRM	Customer Relationship Management
DL&ML	DeLone and McLean Information System Success Model
ECM	Expectation-Confirmation Model
EFA	Exploratory Factor Analysis
ERP	Enterprise Resource Planning
HTMT	Heterotrait-Monotrait ratio
IDT	Innovation Diffusion Theory
IS	Information System
KA	Knowledge Acquisition
KAP	Knowledge Application
KM	Knowledge Management
KP	Knowledge Protection
KS	Knowledge Sharing
LMS	Learning Management System
MALL	Mobile Assisted Language Learning
PEOU	Perceived Ease of Use
PLS	Partial Least Squares
PLS-SEM	Partial Least Squares-Structural Equation Modelling
PU	Perceived Usefulness
SDT	Self-Determination Theory
SEM	Structural Equation Modelling
SI	Social Influence Model
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action

UMP	Universiti Malaysia Pahang
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

REFERENCES

- Abatan, O. K., & Maharaj, M. (2014). Analyzing educational and social usage of mobile telecommunications in a South African university. In *International Conference on Information Society* (pp. 64–69). IEEE. <https://doi.org/10.1109/i-Society.2014.7009013>
- Abdullah, M. A., Ebiary, Y. B., & Al-Sammarraie, N. (2017). Determine factors influencing mobile learning acceptance in higher education institution of Malaysia: Online based learning. *International Journal of Contemporary Computer Research (IJCCR)*, 1(1), 43–49.
- Abdullah, R., & Alsharaei, Y. A. M. (2016). A mobile knowledge as a service (mKaaS) model of knowledge management system in facilitating knowledge sharing of cloud education community environment. In *3rd International Conference on Information Retrieval and Knowledge Management* (pp. 143–148). IEEE. <https://doi.org/10.1109/INFRKM.2016.7806351>
- Abdullah, R., & Selamat, H. (2005). A framework for knowledge management system implementation in collaborative environment for higher learning institution. *Journal of Knowledge Management Practice*, 6(1), 1–8.
- Aboelmaged, M. G. (2018). Knowledge sharing through enterprise social network (ESN) systems: Motivational drivers and their impact on employees' productivity. *Journal of Knowledge Management*, 22(2), 362–383. <https://doi.org/10.1108/JKM-05-2017-0188>
- Abu-Al-Aish, A. (2014). *Toward mobile learning deployment in higher education*. Brunel University. <https://doi.org/10.1504/IJMLO.2013.057165>
- Adam, S., & Mahadi, B. (2017). The effectiveness of knowledge management towards organisational performance of internet business in Malaysia. *Malaysian Journal of Business and Economics*, 3(1), 68–80.
- Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In *Action Control* (pp. 11–39). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Prentice-Hall.
- Akour, H. (2009). *Determinants of mobile learning acceptance: An empirical investigation in higher education*. Oklahoma State University. <https://doi.org/3408682>
- Al-Emran, M., Elsherif, H. M., & Shaalan, K. (2016). Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human Behavior*, 56, 93–102. <https://doi.org/10.1016/j.chb.2015.11.033>
- Al-Emran, M., & Shaalan, K. (2015). Learners and educators attitudes towards mobile learning in higher education: State of the art. In *International Conference on*

- Advances in Computing, Communications and Informatics* (pp. 907–913). IEEE. <https://doi.org/10.1109/ICACCI.2015.7275726>
- Al-Gahtani, S. S. (2016). Empirical investigation of e-learning acceptance and assimilation: A structural equation model. *Applied Computing and Informatics*, 12(1), 27–50. <https://doi.org/10.1016/j.aci.2014.09.001>
- Al-Marouf, R. A. S., & Al-Emran, M. (2018). Students acceptance of Google classroom: An exploratory study using PLS-SEM approach. *International Journal of Emerging Technologies in Learning (IJET)*, 13(6), 112–123. <https://doi.org/10.3991/ijet.v13i06.8275>
- Al Emran, M., & Shaalan, K. (2014). E-podium technology: A medium of managing knowledge at al buraimi university college via m-learning. In *BCS International IT Conference* (pp. 1–4). <https://doi.org/10.14236/ewic/bcsme2014.14>
- Alfarsi, G., & Alsinani, M. (2017). Developing a mobile notification system for al buraimi university college students. *International Journal of Information Technology and Language Studies*, 1(1), 10–16.
- Ali, Z., Gongbing, B., & Mehreen, A. (2018). Understanding and predicting academic performance through cloud computing adoption: A perspective of technology acceptance model. *Journal of Computers in Education*, 5(3), 297–327.
- Ali, Z., & Ismail, R. (2013). Design and development of android mobile application for students of engineering education in Saudi Arabia. In *International Conference on Information Society* (pp. 228–233). IEEE.
- Allen, M., Titsworth, S., & Hunt, S. K. (2008). *Quantitative research in communication*. Sage Publications.
- Almaiah, M. A. (2018). Acceptance and usage of a mobile information system services in University of Jordan. *Education and Information Technologies*, 23(5), 1873–1895. <https://doi.org/10.1007/s10639-018-9694-6>
- Almaiah, M. A., Jalil, M. A., & Man, M. (2016a). Extending the TAM to examine the effects of quality features on mobile learning acceptance. *Journal of Computers in Education*, 3(4), 453–485. <https://doi.org/10.1007/s40692-016-0074-1>
- Almaiah, M. A., Jalil, M. A., & Man, M. (2016b). Preliminary study for exploring the major problems and activities of mobile learning system: A case study of Jordan. *Journal of Theoretical and Applied Information Technology*, 93(2), 580–594.
- Alnabhan, M. M., & Aljaraideh, Y. (2014). Collaborative m-learning adoption model: A case study for Jordan. *International Journal of Emerging Technologies in Learning*, 9(8), 4–10. <https://doi.org/10.3991/ijet.v9i8.3639>
- Alotaibi, H., Crowder, R., & Wills, G. (2013). Investigating factors for knowledge sharing using web technologies. In *13th International Conference on Knowledge Management and Knowledge Technologies* (pp. 1–4). ACM. <https://doi.org/10.1145/2494188.2494230>

- AlSagri, H. S., & Zemirli, N. (2015). Toward knowledge management approach to enhance the mobile learning management systems. In *International Conference on Mobile Web and Information Systems* (pp. 74–83). Springer International Publishing. <https://doi.org/10.1007/978-3-319-23144-0>
- Althunibat, A. (2015). Determining the factors influencing students' intention to use m-learning in Jordan higher education. *Computers in Human Behavior*, *52*, 65–71. <https://doi.org/10.1016/j.chb.2015.05.046>
- Alzaza, N. S., & Yaakub, A. R. (2011). Students' awareness and requirements of mobile learning services in the higher education environment. *American Journal of Economics and Business Administration*, *3*(1), 95–100. <https://doi.org/10.3844/ajebasp.2011.95.100>
- Ariffin, S. A. (2011). Mobile learning in the institution of higher learning for Malaysia students: Culture perspectives. *International Journal on Advanced Science, Engineering and Information Technology*, *1*(3), 283–288. <https://doi.org/10.18517/ijaseit.1.3.59>
- Arpaci, I. (2017). Antecedents and consequences of cloud computing adoption in education to achieve knowledge management. *Computers in Human Behavior*, *70*, 382–390. <https://doi.org/10.1016/j.chb.2017.01.024>
- Assegaff, S., Hussin, A. R. C., & Dahlan, H. M. (2011). Perceived benefit of knowledge sharing: Adapting TAM model. In *International Conference on Research and Innovation in Information Systems* (pp. 1–6). IEEE. <https://doi.org/10.1109/ICRIIS.2011.6125744>
- Atif, A., Richards, D., Busch, P., & Bilgin, A. (2015). Assuring graduate competency: A technology acceptance model for course guide tools. *Journal of Computing in Higher Education*, *27*(2), 94–113. <https://doi.org/10.1007/s12528-015-9095-4>
- Azar, A. S., & Nasiri, H. (2014). Learners' attitudes toward the effectiveness of mobile assisted language learning (MALL) in L2 listening comprehension. *Procedia-Social and Behavioral Sciences*, *98*, 1836–1843. <https://doi.org/10.1016/j.sbspro.2014.03.613>
- Bakhsh, M., Mahmood, A., & Sangi, N. A. (2017). Examination of factors influencing students and faculty behavior towards m-learning acceptance: An empirical study. *International Journal of Information & Learning Technology*, *34*(3), 166–188. <https://doi.org/10.1108/IJILT-08-2016-0028>
- Beckman, T. (1997). A methodology for knowledge management. In *International Conference on Artificial Intelligence and Soft Computing* (pp. 29–32). IASTED.
- Bere, A., & Rambe, P. (2016). An empirical analysis of the determinants of mobile instant messaging appropriation in university learning. *Journal of Computing in Higher Education*, *28*(2), 172–198. <https://doi.org/10.1007/s12528-016-9112-2>
- Birch, D., & Burnett, B. (2009). Advancing e-learning policy and practice: Influences on academics' adoption, integration and development of multimodal e-learning courses. In *Institutional Transformation through Best Practices in Virtual Campus*

Development: Advancing E-learning Policies (pp. 65–80). IGI Global.

- Böhm, S., & Constantine, G. P. (2016). Impact of contextuality on mobile learning acceptance. *Interactive Technology and Smart Education*, 13(2), 107–122. <https://doi.org/10.1108/ITSE-02-2016-0003>
- Briz-Ponce, L., & García-Peñalvo, F. J. (2015). An empirical assessment of a technology acceptance model for apps in medical education. *Journal of Medical Systems*, 39(11), 1–5. <https://doi.org/10.1007/s10916-015-0352-x>
- Briz-Ponce, L., Pereira, A., Carvalho, L., Juanes-Méndez, J. A., & García-Peñalvo, F. J. (2017). Learning with mobile technologies – Students’ behavior. *Computers in Human Behavior*, 72, 612–620. <https://doi.org/10.1016/j.chb.2016.05.027>
- Brown, J. S., & Duguid, P. (2000). Balancing act: How to capture knowledge without killing it. *Harvard Business Review*, 78(3), 73–80. <https://doi.org/10.1016/j.clnu.2011.08.005>
- Buabeng-Andoh, C. (2018). New technology in health education: Nursing students’ application of mobile technology in the classroom in Ghana. *Interactive Technology and Smart Education*, 15(1), 46–58. <https://doi.org/10.1108/ITSE-09-2016-0039>
- Buckley, M. R., Comstock, S. M., & Cote, J. A. (1990). Measurement errors in the behavioral sciences: The case of personality/attitude research. *Educational and Psychological Measurement*, 50(3), 447–474. <https://doi.org/10.1177/0013164490503001>
- Bujang, M. N. Bin, & Riaz, R. P. M. (2012). M-Jako Iban: A mobile application to introduce Iban language. In *Symposium on Humanities, Science and Engineering Research* (pp. 1177–1181). IEEE. <https://doi.org/10.1109/SHUSER.2012.6268797>
- Carlos, J., Prieto, S., & Garcia-peñalvo, F. J. (2015). Behavioral intention of use of mobile technologies among pre-service teachers: Implementation of a technology adoption model based on TAM with the constructs of compatibility and resistance to change. In *International Symposium on Computers in Education* (pp. 120–125). IEEE. <https://doi.org/10.1109/SIIE.2015.7451660>
- Cavus, N. (2016). Development of an intelligent mobile application for teaching English pronunciation. *Procedia Computer Science*, 102, 365–369. <https://doi.org/10.1016/j.procs.2016.09.413>
- Cavus, N., & Ibrahim, D. (2009). M-Learning: An experiment in using SMS to support learning new English language words. *British Journal of Educational Technology*, 40(1), 78–91. <https://doi.org/10.1111/j.1467-8535.2007.00801.x>
- Cegarra-Navarro, J. G., Garcia-Perez, A., & Moreno-Cegarra, J. L. (2014). Technology knowledge and governance: Empowering citizen engagement and participation. *Government Information Quarterly*, 31(4), 660–668. <https://doi.org/10.1016/j.giq.2014.07.001>
- Chang, C. C., Yan, C. F., & Tseng, J. S. (2012). Perceived convenience in an extended

- technology acceptance model: Mobile technology and English learning for college students. *Australasian Journal of Educational Technology*, 28(5), 809–826. <https://doi.org/10.14742/ajet.818>
- Chang, C., Liang, C., Yan, C., & Tseng, J. (2013). The impact of college students' intrinsic and extrinsic motivation on continuance intention to use English mobile learning systems. *Asia-Pacific Education Researcher*, 22(2), 181–192. <https://doi.org/10.1007/s40299-012-0011-7>
- Charband, Y., & Navimipour, N. J. (2016). Online knowledge sharing mechanisms: A systematic review of the state of the art literature and recommendations for future research. *Information Systems Frontiers*, 18(6), 1131–1151. <https://doi.org/10.1007/s10796-016-9628-z>
- Cheng, Y. M. (2015). Towards an understanding of the factors affecting m-learning acceptance: Roles of technological characteristics and compatibility. *Asia Pacific Management Review*, 20(3), 109–119. <https://doi.org/10.1016/j.apmr.2014.12.011>
- Cheung, R., & Vogel, D. (2013). Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers & Education*, 63, 160–175. <https://doi.org/10.1016/j.compedu.2012.12.003>
- Chew, H. E., & West, M. (2015). Good intentions to read on mobiles are not good enough: Reducing barriers to m-reading is crucial. In *7th International Conference on Information and Communication Technologies and Development* (pp. 1–5). ACM. <https://doi.org/10.1145/2737856.2737859>
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295(2), 295–336.
- Chiou, W. C., Perng, C., & Lin, C. C. (2009). The relationship between technology acceptance model and usability test - Case of performing e-learning task with PDA. In *International Conference on Information Engineering* (pp. 579–582). IEEE. <https://doi.org/10.1109/ICIE.2009.207>
- Chong, A. Y. L., Chan, F. T. S., Goh, M., & Tiwari, M. K. (2013). Do interorganisational relationships and knowledge-management practices enhance collaborative commerce adoption? *International Journal of Production Research*, 51(7), 2006–2018. <https://doi.org/10.1080/00207543.2012.701776>
- Chung, H. H., Chen, S. C., & Kuo, M. H. (2015). A study of EFL college students' acceptance of mobile learning. *Procedia-Social and Behavioral Sciences*, 176, 333–339. <https://doi.org/10.1016/j.sbspro.2015.01.479>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. NJ: Lawrence Earlbaum Associates. Hillsdale. <https://doi.org/10.1234/12345678>
- Costa, V., & Monteiro, S. (2016). Key knowledge management processes for innovation: A systematic literature review. *VINE Journal of Information and Knowledge Management Systems*, 46(3), 386–410. <https://doi.org/10.1108/VJIKMS-02-2015-0017>

- Crompton, H., Burke, D., & Gregory, K. H. (2017). The use of mobile learning in PK-12 education: A systematic review. *Computers & Education, 110*, 51–63. <https://doi.org/10.1016/j.compedu.2017.03.013>
- Darr, E. D., Argote, L., & Epple, D. (1995). The acquisition, transfer, and depreciation of knowledge in service organizations: Productivity in franchises. *Management Science, 41*(11), 1750–1762. <https://doi.org/10.1287/mnsc.41.11.1750>
- Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. Massachusetts Institute of Technology. <https://doi.org/oclc/56932490>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. <https://doi.org/10.2307/249008>
- 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. <https://doi.org/http://dx.doi.org/10.1287/mnsc.35.8.982>
- Davis, F. D., & Venkatesh, V. (1996). A critical assessment of potential measurement biases in the technology acceptance model: Three experiments. *International Journal of Human-Computer Studies, 45*(1), 19–45. <https://doi.org/10.1006/ijhc.1996.0040>
- De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Academy of Management Perspectives, 14*(4), 113–127. <https://doi.org/10.5465/AME.2000.3979820>
- Di Pietro, L., Guglielmetti Mugion, R., Mattia, G., Renzi, M. F., & Toni, M. (2015). The integrated model on mobile payment acceptance (IMMPA): An empirical application to public transport. *Transportation Research Part C: Emerging Technologies, 56*, 463–479. <https://doi.org/10.1016/j.trc.2015.05.001>
- Diaz, J. C. T., Moro, A. I., & Carrión, P. V. T. (2015). Mobile learning: Perspectives. *International Journal of Educational Technology in Higher Education, 12*(1), 38–49. <https://doi.org/10.7238/rusc.v12i1.1944>
- Dobbins, C., & Denton, P. (2017). MyWallMate: An investigation into the use of mobile technology in enhancing student engagement. *TechTrends, 61*(6), 541–549. <https://doi.org/10.1007/s11528-017-0188-y>
- Donaldson, R. L. (2010). *Student acceptance of mobile learning*. The Florida State University.
- Dong, C., & Liu, X. (2013). Development of android application for language studies. *IERI Procedia, 4*, 8–16. <https://doi.org/10.1016/j.ieri.2013.11.003>
- Driscoll, D. L., Appiah-Yeboah, A., Salib, P., & Rupert, D. J. (2007). Merging qualitative and quantitative data in mixed methods research: How to and why not. *Ecological and Environmental Anthropology, 3*(1), 18–28. <https://doi.org/10.1016/j.jocn.2003.11.015>

- Du, R., Liu, L., Straub, D. W., & Knight, M. B. (2017). The impact of espoused national cultural values on innovative behaviour: An empirical study in the Chinese IT-enabled global service industry. *Asia Pacific Business Review*, 23(3), 354–372. <https://doi.org/10.1080/13602381.2016.1156907>
- Eichhorn, B. R. (2014). Common Method Variance Techniques. *SAS Institute Inc.*
- El-gayar, O., & Moran, M. (2007). Examining students' acceptance of tablet PC using TAM. *Issues in Information Systems*, 8(1), 167–172.
- El Said, G. R. (2015). Understanding knowledge management system antecedents of performance impact: Extending the task-technology fit model with intention to share knowledge construct. *Future Business Journal*, 1(1), 75–87. <https://doi.org/10.1016/j.fbj.2015.11.003>
- Elmorshidy, A. (2012). Mobile learning—A new success model. *The Journal of Global Business Management*, 8(2), 18–27.
- Fadare, O. G., Babatunde, O. H., Theophilus, D., Lawal, O. O., Anglais, A. E., Umé, R. É. S., & French, F. (2011). Behavioral intention for mobile learning on 3G mobile internet technology in south-west part of Nigeria. *World Journal of Engineering and Pure & Applied Sciences*, 1(2), 19–28.
- Fatima, J. K., Ghandforoush, P., Khan, M., & Masico, R. Di. (2017). Role of innovativeness and self-efficacy in tourism m-learning. *Tourism Review*, 72(3), 344–355. <https://doi.org/10.1108/TR-02-2017-0019>
- García-Sánchez, E., García-Morales, V. J., & Bolívar-Ramos, M. T. (2017). The influence of top management support for ICTs on organisational performance through knowledge acquisition, transfer, and utilisation. *Review of Managerial Science*, 11(1), 19–51. <https://doi.org/10.1007/s11846-015-0179-3>
- Garrido-Moreno, A., Lockett, N., & García-Morales, V. (2014). Paving the way for CRM success: The mediating role of knowledge management and organizational commitment. *Information & Management*, 51(8), 1031–1042. <https://doi.org/10.1016/j.im.2014.06.006>
- Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, 4(1), 1–77. <https://doi.org/10.1.1.25.781>
- Gelderblom, H., Dyk, T. Van, & Biljon, J. Van. (2010). Mobile phone adoption: Do existing models adequately capture the actual usage of older adults? In *Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists* (pp. 67–74). ACM. <https://doi.org/10.1145/1899503.1899511>
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *Internet and Higher Education*, 19, 18–26. <https://doi.org/10.1016/j.iheduc.2013.06.002>

- Glackin, B. C., Rodenhiser, R. W., & Herzog, B. (2014). A library and the disciplines: A collaborative project assessing the impact of eBooks and mobile devices on student learning. *Journal of Academic Librarianship*, 40(3), 299–306. <https://doi.org/10.1016/j.acalib.2014.04.007>
- Hair, J. F., Black, W., Babin, B., & Anderson, R. (2006). *Multivariate Data Analysis*. Pearson Prentice Hall. <https://doi.org/10.1080/19447013008687143>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. Prentice Hall. New Jersey.
- 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. <https://doi.org/10.2753/MTP1069-6679190202>
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, 117(3), 442–458. <https://doi.org/10.1108/IMDS-04-2016-0130>
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- 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.
- Hamidi, H., & Chavoshi, A. (2018). Analysis of the essential factors for the adoption of mobile learning in higher education: A case study of students of the University of Technology. *Telematics and Informatics*, 35(4), 1053–1070. <https://doi.org/10.1016/j.tele.2017.09.016>
- Han, S., Kong, W., Liu, Q., & Zhou, L. (2010). Design and implementation of mobile English learning. In *International Conference on Intelligent System Design and Engineering Application* (pp. 510–513). IEEE. <https://doi.org/10.1109/ISDEA.2010.284>
- Hao, S., Dennen, V. P., & Mei, L. (2017). Influential factors for mobile learning acceptance among Chinese users. *Educational Technology Research and Development*, 65(1), 101–123. <https://doi.org/10.1007/s11423-016-9465-2>
- Harchay, A., Cheniti-Belcadhi, L., & Braham, R. (2017). MobiSWAP: Personalized mobile assessment tool based on semantic web and web services. In *14th International Conference on Computer Systems and Applications* (pp. 1406–1413). IEEE. <https://doi.org/10.1109/AICCSA.2017.143>
- Hashim, A. S., Fatimah, W., Ahmad, W., & Ahmad, R. (2010). A study of design principles and requirements for the m-learning application development. In *International Conference on User Science and Engineering* (pp. 226–231). IEEE. <https://doi.org/10.1109/IUSER.2010.5716757>
- Hassanzadeh, A., Kanaani, F., & Elahi, S. (2012). A model for measuring e-learning systems success in universities. *Expert Systems with Applications*, 39(12), 10959–

10966. <https://doi.org/10.1016/j.eswa.2012.03.028>

- Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: Updated guidelines. *Industrial Management & Data Systems*, 116(1), 2–20. <https://doi.org/10.1108/IMDS-09-2015-0382>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hew, T. S., & Kadir, S. L. S. A. (2016). Predicting the acceptance of cloud-based virtual learning environment: The roles of self determination and channel expansion theory. *Telematics and Informatics*, 33(4), 990–1013. <https://doi.org/10.1016/j.tele.2016.01.004>
- Hidding, G. J., & Catterall, S. M. (1998). Anatomy of a learning organization: Turning knowledge into capital at Andersen Consulting. *Knowledge and Process Management*, 5(1), 3–13. [https://doi.org/10.1002/\(SICI\)1099-1441\(199803\)5:1<3::AID-KPM8>3.0.CO;2-O](https://doi.org/10.1002/(SICI)1099-1441(199803)5:1<3::AID-KPM8>3.0.CO;2-O)
- Howell, K. E., & Annansingh, F. (2013). Knowledge generation and sharing in UK universities: A tale of two cultures? *International Journal of Information Management*, 33(1), 32–39. <https://doi.org/10.1016/j.ijinfomgt.2012.05.003>
- Hsia, J. W. (2016). The effects of locus of control on university students' mobile learning adoption. *Journal of Computing in Higher Education*, 28(1), 1–17. <https://doi.org/10.1007/s12528-015-9103-8>
- Hsiao, K.-L., & Chen, C.-C. (2015). How do we inspire children to learn with e-readers? *Library Hi Tech*, 33(4), 584–596. <https://doi.org/10.1108/LHT-04-2015-0038>
- Hsu, C.-L. L., & Lin, J. C.-C. C. (2008). Acceptance of blog usage: The roles of technology acceptance, social influence and knowledge sharing motivation. *Information & Management*, 45(1), 65–74. <https://doi.org/10.1016/j.im.2007.11.001>
- Hsu, C. K., Hwang, G. J., & Chang, C. K. (2013). A personalized recommendation-based mobile learning approach to improving the reading performance of EFL students. *Computers & Education*, 63, 327–336. <https://doi.org/10.1016/j.compedu.2012.12.004>
- Huang, C. (2012). A comparison of fuzzy DNP and SEM in analyzing novel mobile learning technology acceptances by learners. In *International Conference on Fuzzy Theory and Its Applications* (pp. 119–124). IEEE. <https://doi.org/10.1109/iFUZZY.2012.6409686>
- Huang, J., Lin, Y., & Chuang, S. (2007). Elucidating user behavior of mobile learning: A perspective of the extended technology acceptance model. *The Electronic Library*, 25(5), 585–598. <https://doi.org/10.1108/02640470710829569>

- Huang, L. (2017). Acceptance of mobile learning in classroom instruction among college english teachers in China: Using an extended TAM. In *International Conference of Educational Innovation through Technology* (pp. 283–287). IEEE. <https://doi.org/10.1109/EITT.2017.75>
- Huang, Y. (2014). *Empirical analysis on factors impacting mobile learning acceptance in higher engineering education*. University of Tennessee.
- Hung, P., Lam, J., Wong, C., & Chan, T. (2015). A study on using learning management system with mobile app. In *International Symposium on Educational Technology* (pp. 168–172). IEEE. <https://doi.org/10.1109/ISET.2015.41>
- Hunt, S. D., Sparkman Jr, R. D., & Wilcox, J. B. (1982). The pretest in survey research: Issues and preliminary findings. *Journal of Marketing Research*, 19(2), 269–273. <https://doi.org/10.2307/3151627>
- Hurmelinna-Laukkanen, P. (2011). Enabling collaborative innovation – knowledge protection for knowledge sharing. *European Journal of Innovation Management*, 14(3), 303–321. <https://doi.org/10.1108/14601061111148816>
- Hussin, S., Manap, M. R., Amir, Z., & Krish, P. (2012). Mobile learning readiness among Malaysian students at higher learning institutes. *Asian Social Science*, 8(12), 276–283. <https://doi.org/10.5539/ass.v8n12p276>
- Hwang, G. J., & Tsai, C. C. (2011). Research trends in mobile and ubiquitous learning: A review of publications in selected journals from 2001 to 2010. *British Journal of Educational Technology*, 42(4), E65–E70. <https://doi.org/10.1111/j.1467-8535.2011.01183.x>
- Iglesias-Pradas, S., Hernández-García, Á., & Fernández-Cardador, P. (2015). Social factors' influences on corporate wiki acceptance and use. *Journal of Business Research*, 68(7), 1481–1487. <https://doi.org/10.1016/j.jbusres.2015.01.038>
- Iqbal, S., & Bhatti, Z. A. (2017). What drives m-learning? An empirical investigation of university student perceptions in Pakistan. *Higher Education Research and Development*, 36(4), 730–746. <https://doi.org/10.1080/07294360.2016.1236782>
- Ismail, I. B., & Idrus, R. M. (2008). Development of SMS mobile technology for m-learning for distance learners. *International Journal of Interactive Mobile Technologies (IJIM)*, 3(2), 55–57. <https://doi.org/10.3991/ijim.v3i2.724>
- Jeong, H. Y., & Hong, B. H. (2013). A practical use of learning system using user preference in ubiquitous computing environment. *Multimedia Tools and Applications*, 64(2), 491–504. <https://doi.org/10.1007/s11042-012-1026-z>
- Joo, Y. J., Kim, N., & Kim, N. H. (2016). Factors predicting online university students' use of a mobile learning management system (m-LMS). *Educational Technology Research and Development*, 64(4), 611–630. <https://doi.org/10.1007/s11423-016-9436-7>
- Joo, Y. J., Lee, H. W., & Ham, Y. (2014). Integrating user interface and personal innovativeness into the TAM for mobile learning in Cyber University. *Journal of*

- Computing in Higher Education*, 26(2), 143–158. <https://doi.org/10.1007/s12528-014-9081-2>
- Kalyanaraman, P., Anuncia, S. M., & Balasubramanian, V. (2018). An investigation on e-learning tools and techniques towards effective knowledge management. In *Knowledge Computing and its Applications* (pp. 335–346). Springer. https://doi.org/10.1007/978-981-10-8258-0_15
- Kamaludin, H., Kasim, S., Selamat, N., & Hui, B. C. (2012). M-learning application for basic computer architecture. In *International Conference on Innovation Management and Technology Research* (pp. 546–549). IEEE. <https://doi.org/10.1109/ICIMTR.2012.6236455>
- Khan, A. I., Al-Shihi, H., Al-Khanjari, Z. A., & Sarrab, M. (2015). Mobile learning (m-learning) adoption in the middle east: Lessons learned from the educationally advanced countries. *Telematics and Informatics*, 32(4), 909–920. <https://doi.org/10.1016/j.tele.2015.04.005>
- Kim, D., Chun, H., & Lee, H. (2014). Determining the factors that influence college students' adoption of smartphones. *Journal of the Association for Information Science and Technology*, 65(3), 578–588. <https://doi.org/10.1002/asi.22987>
- Kim, S. (2012). Factors affecting the use of social software: TAM perspectives. *The Electronic Library*, 30(5), 690–706. <https://doi.org/10.1108/02640471211275729>
- Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-System Pharmacy*, 65(23), 2276–2284. <https://doi.org/10.2146/ajhp070364>
- King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & Management*, 43(6), 740–755. <https://doi.org/10.1016/j.im.2006.05.003>
- Kitchenham, B., & Charters, S. (2007). Guidelines for performing systematic literature reviews in software engineering. *Software Engineering Group, School of Computer Science and Mathematics, Keele University*, 1–57. <https://doi.org/10.1.1.117.471>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications. <https://doi.org/10.1038/156278a0>
- Koç, T., Turan, A. H., & Okursoy, A. (2016). Acceptance and usage of a mobile information system in higher education: An empirical study with structural equation modeling. *The International Journal of Management Education*, 14(3), 286–300. <https://doi.org/10.1016/j.ijme.2016.06.001>
- Koh, J., & Kim, Y. G. (2004). Knowledge sharing in virtual communities: An e-business perspective. *Expert Systems with Applications*, 26(2), 155–166. [https://doi.org/10.1016/S0957-4174\(03\)00116-7](https://doi.org/10.1016/S0957-4174(03)00116-7)
- Kothari, C. R. (2004). *Research methodology: Methods & techniques*. New Age International. <https://doi.org/10.1017/CBO9781107415324.004>

- Krejcie, R. V, & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Kripanont, N. (2007). *Examining a technology acceptance model of internet usage by academics within Thai business schools*. School of Information Systems. Victoria University.
- Kukulska-Hulme, A. (2007). Mobile usability and user experience. In *Mobile Learning: A Handbook for Educators and Trainers* (pp. 61–72). Routledge. <https://doi.org/10.4324/9780203003428>
- Kwon, T. H., & Zmud, R. W. (1987). Unifying the fragmented models of information systems implementation. In *Critical Issues in Information Systems Research* (pp. 227–251). John Wiley & Sons, Inc.
- Lai, H.-C., Chang, C.-Y., Wen-Shiane, L., Fan, Y.-L., & Wu, Y.-T. (2013). The implementation of mobile learning in outdoor education: Application of QR codes. *British Journal of Educational Technology*, 44(2), E57–E62. <https://doi.org/10.1111/j.1467-8535.2012.01343.x>
- Lau, A., & Tsui, E. (2009). Knowledge management perspective on e-learning effectiveness. *Knowledge-Based Systems*, 22(4), 324–325. <https://doi.org/10.1016/j.knosys.2009.02.014>
- Lee, C., Lee, G., & Lin, H. (2007). The role of organizational capabilities in successful e-business implementation. *Business Process Management Journal*, 13(5), 677–693. <https://doi.org/10.1108/14637150710823156>
- Lee, J.-C., Shiue, Y.-C., & Chen, C.-Y. (2016). Examining the impacts of organizational culture and top management support of knowledge sharing on the success of software process improvement. *Computers in Human Behavior*, 54, 462–474. <https://doi.org/10.1016/j.chb.2015.08.030>
- Lee, J. N. (2001). The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success. *Information & Management*, 38(5), 323–335. [https://doi.org/10.1016/S0378-7206\(00\)00074-4](https://doi.org/10.1016/S0378-7206(00)00074-4)
- Lee, J. N., Huynh, M. Q., & Hirschheim, R. (2008). An integrative model of trust on IT outsourcing: Examining a bilateral perspective. *Information Systems Frontiers*, 10(2), 145–163. <https://doi.org/10.1007/s10796-008-9066-7>
- Lee, K. B., & Salman, R. (2012). The design and development of mobile collaborative learning application using android. *Journal of Information Technology and Application in Education*, 1(1), 1–8.
- Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), 191–204. [https://doi.org/10.1016/S0378-7206\(01\)00143-4](https://doi.org/10.1016/S0378-7206(01)00143-4)
- Lehner, F., & Nösekel, H. (2002). The role of mobile devices in e-learning first experiences with a wireless e-learning environment. In *International Workshop on*

- Wireless and Mobile Technologies in Education* (pp. 103–106). IEEE.
<https://doi.org/10.1109/WMTE.2002.1039229>
- Leong, L. W., Ibrahim, O., Dalvi-Esfahani, M., Shahbazi, H., & Nilashi, M. (2018). The moderating effect of experience on the intention to adopt mobile social network sites for pedagogical purposes: An extension of the technology acceptance model. *Education and Information Technologies*, 23, 2477–2498. <https://doi.org/10.1007/s10639-018-9726-2>
- Liaw, S.-S. S., Hatala, M., & Huang, H.-M. M. (2010). Investigating acceptance toward mobile learning to assist individual knowledge management: Based on activity theory approach. *Computers & Education*, 54(2), 446–454. <https://doi.org/10.1016/j.compedu.2009.08.029>
- Lin, C. (2013). Exploring the relationship between technology acceptance model and usability test. *Information Technology and Management*, 14(3), 243–255. <https://doi.org/10.1007/s10799-013-0162-0>
- Lin, C. C. (2014). Learning English reading in a mobile-assisted extensive reading program. *Computers & Education*, 78, 48–59. <https://doi.org/10.1016/j.compedu.2014.05.004>
- Lin, H. F. (2013). The effects of knowledge management capabilities and partnership attributes on the stage-based e-business diffusion. *Internet Research*, 23(4), 439–464. <https://doi.org/http://dx.doi.org/10.1108/IntR-11-2012-0233>
- Lin, H. F., & Lee, G. G. (2005). Impact of organizational learning and knowledge management factors on e-business adoption. *Management Decision*, 43(2), 171–188. <https://doi.org/10.1108/00251740510581902>
- Lin, H., & Hwang, Y. (2014). Do feelings matter? The effects of intrinsic benefits on individuals' commitment toward knowledge systems. *Computers in Human Behavior*, 30, 191–198. <https://doi.org/10.1016/j.chb.2013.07.056>
- Liu, D., & Guo, X. (2017). Exploring gender differences in acceptance of mobile computing devices among college students. *Information Systems and E-Business Management*, 15(1), 197–223. <https://doi.org/10.1007/s10257-016-0315-x>
- Liu, Y., Li, H., & Carlsson, C. (2010). Factors driving the adoption of m-learning: An empirical study. *Computers & Education*, 55(3), 1211–1219. <https://doi.org/10.1016/j.compedu.2010.05.018>
- Lu, X., & Viehland, D. (2008). Factors influencing the adoption of mobile learning. In *19th Australasian Conference on Information Systems* (pp. 597–606).
- Mac Callum, K., & Jeffrey, L. (2013). The influence of students' ICT skills and their adoption of mobile learning. *Australasian Journal of Educational Technology*, 29(3), 303–314. <https://doi.org/10.1234/ajet.v29i3.298>
- Mac Callum, K., Jeffrey, L., & Kinshuk. (2014). Comparing the role of ICT literacy and anxiety in the adoption of mobile learning. *Computers in Human Behavior*, 39, 8–19. <https://doi.org/10.1016/j.chb.2014.05.024>

- Maditinos, D., Chatzoudes, D., & Sarigiannidis, L. (2014). Factors affecting e-business successful implementation. *International Journal of Commerce and Management*, 24(4), 300–320. <https://doi.org/10.1108/IJCoMA-07-2012-0043>
- Maditinos, D., Chatzoudes, D., & Tsairidis, C. (2011). Factors affecting ERP system implementation effectiveness. *Journal of Enterprise Information Management*, 25(1), 60–78. <https://doi.org/10.1108/17410391211192161>
- Malhotra, M. K., & Grover, V. (1998). An assessment of survey research in POM: From constructs to theory. *Journal of Operations Management*, 16(4), 407–425. [https://doi.org/10.1016/S0272-6963\(98\)00021-7](https://doi.org/10.1016/S0272-6963(98)00021-7)
- Marangunić, N., & Granić, A. (2015). Technology acceptance model: A literature review from 1986 to 2013. *Universal Access in the Information Society*, 14(1), 81–95. <https://doi.org/10.1007/s10209-014-0348-1>
- Martin, L. M., & Matlay, H. (2003). Innovative use of the Internet in established small firms: The impact of knowledge management and organisational learning in accessing new opportunities. *Qualitative Market Research: An International Journal*, 6(1), 18–26. <https://doi.org/10.1108/13522750310457348>
- Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research*, 2(3), 173–191. <https://doi.org/10.1287/isre.2.3.173>
- Mcconatha, D., Praul, M., & Chester, W. (2008). Mobile learning in higher education: An empirical assessment of a new educational tool. *Turkish Online Journal of Educational Technology-TOJET*, 7(3), 15–21.
- Migdadi, M. M., Abu Zaid, M. K. S., Al-Hujran, O. S., & Aloudat, A. M. (2016). An empirical assessment of the antecedents of electronic-business implementation and the resulting organizational performance. *Internet Research*, 26(3), 661–688. <https://doi.org/10.1108/IntR-08-2014-0203>
- Miller, D. (1991). Stale in the saddle: CEO tenure and the match between organization and environment. *Management Science*, 37(1), 34–52. <https://doi.org/10.1287/mnsc.37.1.34>
- Ming-ming, H., Tie-nan, W., & Xuan, X. (2010). Knowledge application process and assimilation of inter-organizational information systems: An empirical study. In *International Conference on Management Science & Engineering* (pp. 916–922). IEEE. <https://doi.org/10.1109/ICMSE.2010.5719908>
- Mirski, P. J., & Abfalter, D. (2004). Knowledge enhancement on site—guests’ attitudes towards m-Learning (pp. 592–600).
- Mitchell, H. J., & Unitec, N. Z. (2003). Technology and knowledge management: Is technology just an enabler or does it also add value? In *Knowledge Management: Current Issues and Challenges* (pp. 66–78). IGI Global. <https://doi.org/10.4018/978-1-93177-751-3.ch006>
- Moghavvemi, S., Sharabati, M., Klobas, J. E., & Sulaiman, A. (2018). Effect of trust

- and perceived reciprocal benefit on students' knowledge sharing via facebook and academic performance. *The Electronic Journal of Knowledge Management*, 16(1), 23–35.
- Mohammadi, H. (2015). Social and individual antecedents of m-learning adoption in Iran. *Computers in Human Behavior*, 49, 191–207. <https://doi.org/10.1016/j.chb.2015.03.006>
- Molina, A. I., Redondo, M. A., Lacave, C., & Ortega, M. (2014). Assessing the effectiveness of new devices for accessing learning materials: An empirical analysis based on eye tracking and learner subjective perception. *Computers in Human Behavior*, 31, 475–490. <https://doi.org/10.1016/j.chb.2013.04.022>
- Mota, J. M., Ruiz-Rube, I., Doderó, J. M., & Arnedillo-Sánchez, I. (2018). Augmented reality mobile app development for all. *Computers and Electrical Engineering*, 65, 250–260. <https://doi.org/10.1016/j.compeleceng.2017.08.025>
- Musleh, J. S. (2015). *Effects of risk, trust and attitude on online shopping intention*. Multimedia University, Malaysia.
- Nikou, S. A., & Economides, A. A. (2014a). A model for mobile-based assessment adoption based on self-determination theory of motivation. In *International Conference on Interactive Mobile Communication Technologies and Learning* (pp. 86–90). IEEE. <https://doi.org/10.1109/IMCTL.2014.7011111>
- Nikou, S. A., & Economides, A. A. (2014b). Acceptance of mobile-based assessment from the perspective of self-determination theory of motivation. In *14th International Conference on Advanced Learning Technologies* (pp. 454–458). IEEE. <https://doi.org/10.1109/ICALT.2014.136>
- Nikou, S. A., & Economides, A. A. (2015). The effects of perceived mobility and satisfaction on the adoption of mobile-based assessment. In *International Conference on Interactive Mobile Communication Technologies and Learning* (pp. 167–171). IEEE. <https://doi.org/10.1109/IMCTL.2015.7359579>
- Nikou, S. A., & Economides, A. A. (2016). An outdoor mobile-based assessment activity: Measuring students' motivation and acceptance. *International Journal of Interactive Mobile Technologies (IJIM)*, 10(4), 11–17. <https://doi.org/10.3991/ijim.v10i4.5541>
- Nikou, S. A., & Economides, A. A. (2017a). Mobile-based assessment: Integrating acceptance and motivational factors into a combined model of self-determination theory and technology acceptance. *Computers in Human Behavior*, 68, 83–95. <https://doi.org/10.1016/j.chb.2016.11.020>
- Nikou, S. A., & Economides, A. A. (2017b). Mobile-based assessment: Investigating the factors that influence behavioral intention to use. *Computers & Education*, 109, 56–73. <https://doi.org/10.1016/j.compedu.2017.02.005>
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37. <https://doi.org/10.1287/orsc.5.1.14>

- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press. [https://doi.org/10.1016/0024-6301\(96\)81509-3](https://doi.org/10.1016/0024-6301(96)81509-3)
- Ooi, K. B., Sim, J. J., Yew, K. T., & Lin, B. (2011). Exploring factors influencing consumers' behavioral intention to adopt broadband in Malaysia. *Computers in Human Behavior*, 27(3), 1168–1178. <https://doi.org/10.1016/j.chb.2010.12.011>
- Oyelere, S. S., & Suhonen, J. (2016). Design and implementation of MobileEdu m-learning application for computing education in Nigeria: A design research approach. In *International Conference on Learning and Teaching in Computing and Engineering* (pp. 27–31). IEEE. <https://doi.org/10.1109/LaTiCE.2016.3>
- Oyelere, S. S., Suhonen, J., Wajiga, G. M., & Sutinen, E. (2018). Design, development, and evaluation of a mobile learning application for computing education. *Education and Information Technologies*, 23(1), 467–495. <https://doi.org/10.1007/s10639-017-9613-2>
- Park, M. J., Dulambazar, T., & Rho, J. J. (2013). The effect of organizational social factors on employee performance and the mediating role of knowledge sharing: Focus on e-government utilization in Mongolia. *Information Development*, 31(1), 53–68. <https://doi.org/10.1177/0266666913494908>
- Park, S. Y., Nam, M. M.-W., & Cha, S. S.-B. (2012). University students' behavioral intention to use mobile learning: Evaluating the technology acceptance model. *British Journal of Educational Technology*, 43(4), 592–605. <https://doi.org/10.1111/j.1467-8535.2011.01229.x>
- Park, Y., Son, H., & Kim, C. (2012). Investigating the determinants of construction professionals' acceptance of web-based training: An extension of the technology acceptance model. *Automation in Construction*, 22, 377–386. <https://doi.org/10.1016/j.autcon.2011.09.016>
- Pindeh, N., Suki, N. M., & Suki, N. M. (2016). User acceptance on mobile apps as an effective medium to learn Kadazandusun language. *Procedia Economics and Finance*, 37, 372–378. [https://doi.org/10.1016/S2212-5671\(16\)30139-3](https://doi.org/10.1016/S2212-5671(16)30139-3)
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Ponce, L. B., Méndez, J. A. J., & García-Peñalvo, F. J. (2014). Analysis of certificated mobile application for medical education purposes. In *2nd International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 13–17). ACM. <https://doi.org/10.1145/2669711.2669871>
- Poong, Y. S., Yamaguchi, S., & Takada, J. I. (2017). Investigating the drivers of mobile learning acceptance among young adults in the World Heritage town of Luang Prabang, Laos. *Information Development*, 33(1), 57–71. <https://doi.org/10.1177/0266666916638136>

- Prieto, J. C. S., Migueláñez, S. O., & García-Peñalvo, F. J. (2014a). ICTs integration in education: Mobile learning and the technology acceptance model (TAM). In *2nd International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 683–687). ACM. <https://doi.org/10.1145/2669711.2669974>
- Prieto, J. C. S., Migueláñez, S. O., & García-Peñalvo, F. J. (2014b). Mobile learning adoption from informal into formal: An extended TAM model to measure mobile acceptance among teachers. In *2nd International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 595–602). ACM. <https://doi.org/10.1145/2669711.2669961>
- Prieto, J. C. S., Migueláñez, S. O., & García-Peñalvo, F. J. (2015). Mobile acceptance among pre-service teachers: A descriptive study using a TAM-based model. In *3rd International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 131–137). ACM. <https://doi.org/10.1145/2808580.2808601>
- Prieto, J. C. S., Migueláñez, S. O., & García-Peñalvo, F. J. (2016). Subjective norm and behavioral intention to use mobile technologies: A descriptive study on the attitudes of future primary education teachers. In *International Symposium on Computers in Education* (pp. 1–6). IEEE. <https://doi.org/10.1109/SIIE.2016.7751847>
- Prieto, J. C. S., Migueláñez, S. O., & García-Peñalvo, F. J. (2017). Assessment of the disposition of future secondary education teachers towards mobile learning. In *5th International Conference on Technological Ecosystems for Enhancing Multiculturality* (pp. 1–6). ACM. <https://doi.org/10.1145/3144826.3145374>
- Punch, K. F. (1998). *Introduction to social research: Quantitative and qualitative approaches*. SAGE Publications. <https://doi.org/10.2307/2348599>
- Qian, J., & Guo-Jie, H. (2015). The impact of knowledge acquisition and knowledge integration of IT outsourcing supplier on outsourcing success-knowledge sticky's moderating effect. In *International Conference on Service Science* (pp. 57–62). IEEE. <https://doi.org/10.1109/ICSS.2015.9>
- Qin, L., Li, N., Zha, S., & He, W. (2017). Research on factors influencing perceived usefulness of a virtual teacher community: A case study of rural teachers in Inner Mongolia, China. *Telematics and Informatics*, 34(5), 463–471. <https://doi.org/10.1016/j.tele.2016.09.008>
- Ramayah, T., & Suki, N. M. (2006). Intention to use mobile PC among MBA students: Implications for technology integration in the learning curriculum. *Unitar E-Journal*, 2(2), 30–39.
- Rao, Y., Guo, K. H., & Chen, Y. (2015). Information systems maturity, knowledge sharing, and firm performance. *International Journal of Accounting & Information Management*, 23(2), 106–127. <https://doi.org/http://dx.doi.org/10.1108/MRR-09-2015-0216>
- Raza, S. A., Umer, A., Qazi, W., & Makhdoom, M. (2018). The effects of attitudinal, normative, and control beliefs on m-learning adoption among the students of higher education in Pakistan. *Journal of Educational Computing Research*, 56(4),

563–588. <https://doi.org/10.1177/0735633117715941>

- Razali, N. M., & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, 2(1), 21–33. <https://doi.org/doi:10.1515/bile-2015-0008>
- Ringle, C. M., Wende, S., & Becker, J.-M. (2015). SmartPLS 3. Bönningstedt: SmartPLS. Retrieved from <http://www.smartpls.com>
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In *Social Psychophysiology: A Sourcebook* (pp. 153–176).
- Sabah, N. M. (2016). Exploring students' awareness and perceptions: Influencing factors and individual differences driving m-learning adoption. *Computers in Human Behavior*, 65, 522–533. <https://doi.org/10.1016/j.chb.2016.09.009>
- Sammour, G., Schreurs, J., Al-Zoubi, A. Y., & Vanhoof, K. (2008). The role of knowledge management and e-learning in professional development. *International Journal of Knowledge and Learning*, 4(5), 465–477. <https://doi.org/10.1504/IJKL.2008.022064>
- Sánchez-Prieto, J. C., Olmos-Migueláñez, S., & García-Peñalvo, F. J. (2016). Informal tools in formal contexts: Development of a model to assess the acceptance of mobile technologies among teachers. *Computers in Human Behavior*, 55, 519–528. <https://doi.org/10.1016/j.chb.2015.07.002>
- Sánchez-Prieto, J. C., Olmos-Migueláñez, S., & García-Peñalvo, F. J. (2017). MLearning and pre-service teachers: An assessment of the behavioral intention using an expanded TAM model. *Computers in Human Behavior*, 72, 644–654. <https://doi.org/10.1016/j.chb.2016.09.061>
- Sarrab, M., Shibli, I. Al, & Badursha, N. (2016). An empirical study of factors driving the adoption of mobile learning in Omani higher education. *International Review of Research in Open and Distributed Learning*, 17(4), 331–349. <https://doi.org/10.19173/irrodl.v17i4.2614>
- Scholtz, B., & Kapeso, M. (2014). An m-learning framework for ERP systems in higher education. *Interactive Technology and Smart Education*, 11(4), 287–301. <https://doi.org/10.1108/ITSE-09-2014-0030>
- Sek, Y.-W., Lau, S.-H., Teoh, K.-K., Law, C.-Y., & Parumo, S. Bin. (2010). Prediction of user acceptance and adoption of smart phone for learning with technology acceptance model. *Journal of Applied Sciences*, 10(20), 2395–2402. <https://doi.org/10.3923/jas.2010.2395.2402>
- Sekaran, & Bougie. (2013). *Research methods for business: A skill-building approach*. Wiley.
- Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach*. John Wiley & Sons. [https://doi.org/10.1016/0024-6301\(93\)90168-F](https://doi.org/10.1016/0024-6301(93)90168-F)

- Seliaman, M. E., & Al-Turki, M. S. (2012). Mobile learning adoption in Saudi Arabia. *World Academy of Science, Engineering and Technology*, 6(9), 1129–1131.
- Shanmugapriya, M., & Tamilarasia, A. (2011). Designing an m-learning application for a ubiquitous learning environment in the android based mobile devices using web services. *Indian Journal of Computer Science and Engineering*, 2(1), 22–30.
- Shao, Z., Feng, Y., & Liu, L. (2012). The mediating effect of organizational culture and knowledge sharing on transformational leadership and Enterprise Resource Planning systems success: An empirical study in China. *Computers in Human Behavior*, 28, 2400–2413. <https://doi.org/10.1016/j.chb.2012.07.011>
- Sharma, P., Crawford, J., & Yetton, P. (2009). Estimating the effect of common method variance: The method-method pair technique with an illustration from TAM research. *MIS Quarterly*, 33(3), 473–490. <https://doi.org/10.2307/20650305>
- Sharp, J. H. (2007). Development, extension, and application: A review of the technology acceptance model. *Information Systems Education Journal*, 5(9), 1–11.
- Shrafat, F. D. (2018). Examining the factors influencing knowledge management system (KMS) adoption in small and medium enterprises SMEs. *Business Process Management Journal*, 24(1), 234–265. <https://doi.org/10.1108/BPMJ-10-2016-0221>
- Shyu, S. H. P., & Huang, J. H. (2011). Elucidating usage of e-government learning: A perspective of the extended technology acceptance model. *Government Information Quarterly*, 28(4), 491–502. <https://doi.org/10.1016/j.giq.2011.04.002>
- Soleimani, E., Ismail, K., & Mustafa, R. (2014). The acceptance of mobile assisted language learning (MALL) among post graduate ESL students in UKM. *Procedia-Social and Behavioral Sciences*, 118, 457–462. <https://doi.org/10.1016/j.sbspro.2014.02.062>
- Soto-Acosta, P., Popa, S., & Palacios-Marqués, D. (2017). Social web knowledge sharing and innovation performance in knowledge-intensive manufacturing SMEs. *Journal of Technology Transfer*, 42(2), 425–440. <https://doi.org/10.1007/s10961-016-9498-z>
- Spachos, D., Hatzichristou, D., & Bamidis, P. (2014). Using mobile applications in continuing medical education. In *International Conference on Interactive Mobile Communication Technologies and Learning* (pp. 301–304). IEEE. <https://doi.org/10.1109/IMCTL.2014.7011152>
- Suki, N. M., & Suki, N. M. (2011). Users' behavior towards ubiquitous m-learning. *Turkish Online Journal of Distance Education*, 12(3), 118–129.
- Sun, J., Chang, K.-Y., & Chen, Y.-H. (2015). GPS sensor-based mobile learning for English: An exploratory study on self-efficacy, self-regulation and student achievement. *Research and Practice in Technology Enhanced Learning*, 10(1), 1–18. <https://doi.org/10.1186/s41039-015-0024-y>
- Sung, Y.-T., Chang, K.-E., & Liu, T.-C. (2016). The effects of integrating mobile

- devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, 94, 252–275. <https://doi.org/10.1016/j.compedu.2015.11.008>
- Tamjidyamcholo, A., Bin Baba, M. S., Shuib, N. L. M., & Rohani, V. A. (2014). Evaluation model for knowledge sharing in information security professional virtual community. *Computers & Security*, 43, 19–34. <https://doi.org/10.1016/j.cose.2014.02.010>
- Tan, G. W. H., Ooi, K. B., Leong, L. Y., & Lin, B. (2014). Predicting the drivers of behavioral intention to use mobile learning: A hybrid SEM-Neural Networks approach. *Computers in Human Behavior*, 36, 198–213. <https://doi.org/10.1016/j.chb.2014.03.052>
- Tan, L. P., & Wong, K. Y. (2017). A neural network approach for predicting manufacturing performance using knowledge management metrics. *Cybernetics and Systems*, 48(4), 348–364. <https://doi.org/10.1080/01969722.2017.1285161>
- Tarhini, A. (2013). *The effects of individual-level culture and demographic characteristics on e-learning acceptance in lebanon and england: A structural equation modelling approach*. Brunel University.
- Tarhini, A., Hone, K., & Liu, X. (2013). Factors affecting students' acceptance of e-learning environments in developing countries: A structural equation modeling approach. *International Journal of Information and Education Technology*, 3(1), 54–59. <https://doi.org/10.7763/IJJET.2013.V3.233>
- Theng, Y.-L. (2009). Mobile learning for tertiary students: An exploratory study of acceptance of use. In *Conference on Educational Multimedia, Hypermedia & Telecommunications* (pp. 937–946). Association for the Advancement of Computing in Education (AACE).
- Theng, Y.-L., Tan, K.-L., Lim, E.-P., Zhang, J., Goh, D. H.-L., Chatterjea, K., ... Vo, M. C. (2007). Mobile g-portal supporting collaborative sharing and learning in geography fieldwork: An empirical study. In *7th Conference on Digital Libraries* (pp. 462–471). ACM. <https://doi.org/10.1145/1255175.1255269>
- Tiwana, A. (2000). *The knowledge management toolkit*. Prentice Hall PTR.
- Tlili, A., Essalmi, F., & Jemni, M. (2016). Improving learning computer architecture through an educational mobile game. *Smart Learning Environments*, 3, 1–14. <https://doi.org/10.1186/s40561-016-0030-6>
- Traxler, J. (2004). Mobile learning—evaluating the effectiveness and the cost. In *Research and Development: Learning with Mobile Devices* (pp. 183–188).
- Tsai, J. C.-A., & Hung, S.-Y. (2016). Determinants of knowledge management system adoption in health care. *Journal of Organizational Computing and Electronic Commerce*, 26(3), 244–266. <https://doi.org/10.1080/10919392.2016.1194062>
- Turban, E., Sharda, R., & Delen, D. (2011). *Decision Support and Business Intelligence Systems*. Prentice Hall.

- 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. <https://doi.org/10.1037/0021-9010.90.4.710>
- Vel, V., Park, I., & Liu, J. (2018). The effect of enterprise crowdsourcing systems on employees' innovative behavior and job performance. In *51st Hawaii International Conference on System Sciences* (pp. 175–184).
- Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, *39*(2), 273–315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- 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., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, *27*(3), 425–478. <https://doi.org/10.2307/30036540>
- Verhoeven, J. C., Heerwegh, D., & De Wit, K. (2010). Information and communication technologies in the life of university freshmen: An analysis of change. *Computers & Education*, *55*(1), 53–66. <https://doi.org/10.1016/j.compedu.2009.12.002>
- Viberg, O., & Grönlund, Å. (2013). Cross-cultural analysis of users' attitudes toward the use of mobile devices in second and foreign language learning in higher education: A case from Sweden and China. *Computers & Education*, *69*, 169–180. <https://doi.org/10.1016/j.compedu.2013.07.014>
- Wai, I. S. H., Ng, S. S. Y., Chiu, D. K. W., Ho, K. K. W., & Lo, P. (2018). Exploring undergraduate students' usage pattern of mobile apps for education. *Journal of Librarianship and Information Science*, *50*(1), 34–47. <https://doi.org/10.1177/0961000616662699>
- Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human Resource Management Review*, *20*(2), 115–131. <https://doi.org/10.1016/j.hrmr.2009.10.001>
- Wang, T. S. (2012). The relevant research of mobile learning mode and information ability indicator in countrified area. In *6th International Conference on Genetic and Evolutionary Computing* (pp. 95–98). IEEE. <https://doi.org/10.1109/ICGEC.2012.143>
- Wang, T. S. (2013). Design and assessment of joyful mobile navigation systems based on TAM and integrating learning models applied on ecological teaching activity. *Eurasia Journal of Mathematics, Science and Technology Education*, *9*(2), 201–212. <https://doi.org/10.12973/eurasia.2013.9210a>
- Watjatrakul, B. (2013). Intention to use a free voluntary service. *Journal of Systems and Information Technology*, *15*(2), 202–220. <https://doi.org/10.1108/13287261311328903>

- Wen, C., & Zhang, J. (2015). Design of a Microlecture Mobile Learning System Based on Smartphone and Web Platforms. *IEEE Transactions on Education*, 58(3), 203–207. <https://doi.org/10.1109/TE.2014.2363627>
- Wendeson, S., Ahmad, W. F. W., & Haron, N. S. (2010). Development of mobile learning tool. In *International Symposium on Information Technology* (pp. 139–144). IEEE. <https://doi.org/10.1109/ITSIM.2010.5561408>
- Wu, W.-H., Wu, Y.-C. J., Chen, C.-Y., Kao, H.-Y., Lin, C.-H., & Huang, S.-H. (2012). Review of trends from mobile learning studies: A meta-analysis. *Computers & Education*, 59(2), 817–827.
- Ye, H., Li, R., & Geng, M. (2010). Research on the factors of affecting the mobile learning. In *3rd International Symposium on Knowledge Acquisition and Modeling* (pp. 313–316). IEEE. <https://doi.org/10.1109/KAM.2010.5646160>
- Yee-Loong Chong, A., Ooi, K.-B., Bao, H., & Lin, B. (2014). Can e-business adoption be influenced by knowledge management? An empirical analysis of Malaysian SMEs. *Journal of Knowledge Management*, 18(1), 121–136. <https://doi.org/10.1108/JKM-08-2013-0323>
- Yen, D. C., Wu, C. S., Cheng, F. F., & Huang, Y. W. (2010). Determinants of users' intention to adopt wireless technology: An empirical study by integrating TTF with TAM. *Computers in Human Behavior*, 26(5), 906–915. <https://doi.org/10.1016/j.chb.2010.02.005>
- Yen, Y. S., & Wu, F. S. (2016). Predicting the adoption of mobile financial services: The impacts of perceived mobility and personal habit. *Computers in Human Behavior*, 65, 31–42. <https://doi.org/10.1016/j.chb.2016.08.017>
- Yoon, H.-Y. (2016). User acceptance of mobile library applications in academic libraries: An application of the technology acceptance model. *The Journal of Academic Librarianship*, 42(6), 687–693. <https://doi.org/10.1016/j.acalib.2016.08.003>
- Zahedi, M., Shahin, M., & Babar, M. A. (2016). A systematic review of knowledge sharing challenges and practices in global software development. *International Journal of Information Management*, 36(6), 995–1019. <https://doi.org/10.1016/j.ijinfomgt.2016.06.007>
- Zhang, C., Huang, J., Chen, J., Li, M., Lee, H. J., Choi, J., & Kim, J. W. (2010). Research on adoption of mobile virtual community in China and Korea. In *9th International Conference on Mobile Business and Global Mobility Roundtable* (pp. 220–229). IEEE. <https://doi.org/10.1109/ICMB-GMR.2010.26>
- Zhang, J., Chang, C., & Zhou, P. (2015). Factors affecting the acceptance of mobile devices in the classroom. In *International Conference of Educational Innovation through Technology* (pp. 294–298). IEEE. <https://doi.org/10.1109/EITT.2015.67>
- Zhang, X., De Pablos, P. O., & Xu, Q. (2014). Culture effects on the knowledge sharing in multi-national virtual classes: A mixed method. *Computers in Human Behavior*, 31, 491–498. <https://doi.org/10.1016/j.chb.2013.04.021>

- Zhang, X., Ordóñez De Pablos, P., & Zhou, Z. (2013). Effect of knowledge sharing visibility on incentive-based relationship in electronic knowledge management systems: An empirical investigation. *Computers in Human Behavior*, 29(2), 307–313. <https://doi.org/10.1016/j.chb.2012.01.029>
- Zhao, Y., & Zhu, Q. (2010). Influence factors of technology acceptance model in mobile learning. In *4th International Conference on Genetic and Evolutionary Computing* (pp. 542–545). IEEE. <https://doi.org/10.1109/ICGEC.2010.139>