Journal of Education & Social Sciences

Journal of Education & Social Sciences

ISSN: 2410-5767 (Online)
ISSN: 2414-8091 (Print)

Using Facebook to Enhance the Academic Ability of Undergraduate Students

Affiliation:
Uzma Qazi
PhD Candidate, University of Karachi.
Email: uhqazi@gmail.com
Muhammad Osama Shafiq
Assistant Professor, Dept. of Mass Communication, University of Karachi.
Email: osamashafiq@gmail.com

Manuscript Information
Submission Date: August 21, 2021
Reviews Completed: October 13, 2021
Acceptance Date: October 27, 2021
Publication Date: November 05, 2021

Citation in APA Style:
Qazi, U., & Shafiq, M. O. (2021). Using Facebook to Enhance the Academic Ability of Undergraduate Students, *Journal of Education & Social Sciences, 9*(2), 75-87.

DOI: https://doi.org/ 10.20547/jess0922109201

.

Journal of Education & Social Sciences
Vol. 9(2): 75-87, 2021
DOI: 10.20547/jess0922109201

Using Facebook to Enhance the Academic Ability of Undergraduate Students

Uzma Qazi [*] Muhammad Osama Shafiq [†]

Abstract: *The purpose of this study is to examine the role of Facebook adoption on the academic capabilities of undergraduate university students. An online survey was conducted to collect the empirical data of 470 undergraduate students from public and private sector universities in Pakistan. The study applied structural equation modeling (SEM) to estimate the proposed conceptual model. The empirical results show that the adoption of Facebook has significant and positive effects on undergraduate students. These findings provide significant policy implications for higher education institutes.*

Keywords: Adoption of Facebook, purpose, educational usage, undergraduate students.

Introduction

The rapid advancement in social media has brought significant changes in the distribution of information. It has enabled individuals to present themselves in a different way. Such an explosion of networking sites and social media influence the individuals especially young people. Junco (2014) and other studies have found that social networking sites have significantly impacted the young people, not only for entertainment but also for educational purposes. Studies show that millions of students have adopted social media platform with some purpose in mind.

Facebook is considered as the most popular networking sites nowadays. According to the statistics (2021), Facebook has 2.8 billion active users monthly, making 59 percent of all social media users. Due to this tremendous growth, Facebook has also become popular among the students. It offers wide range of features that help them to learn in a modern way. Such features are, formation of groups, chat with peers and family, comments and likes, newsfeed, sharing, etc (Abrahim, Mir, Suhara, Mohamed, & Sato, 2019). These features are not only used for fun and entertainment but also be used for learning.

In the digital era, it has now become essential for the educational institutes to switch from the traditional to the learning-centered approach. Hartman, Moskal, and Dziuban (2005) stated that institutions should focus on learning-centered approach, where student

[*]PhD Candidate, University of Karachi. Email: uhqazi@gmail.com
[†]Assistant Professor, Dept of Mass Communication, University of Karachi. Email: osamashafiq@gmail.com

Received August 21, 2021; Received in revised form October 13, 2021; Accepted October 27, 2021; Available online November 05, 2021

not only share material but also focus on their self-learning (Abusbiha & Mustaffa, 2014). Institutions need to shift the paradigm by focusing on the learning-centered approach. The Economic Survey of Pakistan (2020) indicated that country has not made any substantial improvement in literacy rate, which expanded just 2% during the most recent four years and at present stands at 60% literacy rate.

One of the important reason for the low literacy rate is inconsistency of educational policies. Among them, the predominant reason is conventional methods of teachings. The Higher Education Commission of Pakistan (HEC) initiated several programs to promote non-conventional teaching. For instance, they have introduced Learning Management System (LMS) to promote E-learning. Hartman et al. (2005) emphasised the need of transforming traditional teacher centric method to student focused collaborative learning.

The above discussion indicates that non-conventional teaching method can enhance literacy rate in Pakistan. Therefore, it is important to consider social media such as Facebook as an important tool fool learning. As mentioned above, the significance of Facebook can have a huge impact on the academic performance of students (Ainin, Naqshbandi, Moghavvemi, & Jaafar, 2015). It plays an important role in the lives of all individuals, especially students. Through Facebook, it easier for students to collaborate and share study material with peers and instructors.

Given the importance of social media notably Facebook as a tool for education, it is important to address whether this Facebook can be considered as a substantive tool for education in Pakistan. To address the issues, the present research aims to investigate whether Facebook could be perceived as an educational tool (Akram & Albalawi, 2016; Al-Rahmi, Alias, Othman, Marin, & Tur, 2018). Another area of research is finding if Facebook could be used by undergrads for educational purposes. The objective is to examine whether Facebook can be used as a platform of online learning when coupled with proper feedback and assessment to students.

Literature Review

In the past, researchers have used several models and theories to explain an individual's behaviour towards an adoption of any new technology. In this paper, we tried to explain and predict the adoption of Facebook and educational usage among undergraduate students. Literature suggests several theories that explain the current conceptual, such as, unified theory of acceptance and use of technology (UTAUT) proposed by Venkatesh and Zhang (2010). It depicts the intention of an individual to behave in certain way towards an adoption of advance technology. In this case, we attempt to comprehend the adoption of social media such as Facebook and how it affects the educational usage of students. In addition to the UTAUT model, the proposed model can also comprehended by technology acceptance mode (TAM) given by Davis (1989). This model suggests factors that lead the individual to use and adopt any technology.

Adoption and Purpose of Using Facebook

Al-Rahmi and Zeki (2017) investigated ways of improving learner performance through a model that relied on social networking sites. The study used data from 340 respondents belonging to University of Technology Malaysia. The research model originated from the constructivism's theory or TAM (technology acceptance model), On the basis of this theory, the communication between students and facilitators is an essential phase in embracing commitment and active collaborative learning. To verify the constructs, the test of CFA was employed. Here, perceived usefulness, perceived enjoyment and perceived ease of use was used as independent variables or social media use; collaborative learning and student satisfaction act as mediators, while learner's performance used as dependent variable. The research's findings illustrated the direct or indirect influence that considers being significant of the constructs mentioned above on collaborative learning through the use of social networking sites that cause good student's performance.

Durak (2019) identified the adoption and utilization of online social networking through facilitators pre-service in the domain of acceptance unified theory and utilization of technology model. This theory used for educational purpose by using the sample size of 274 respondents. The study included performance expectancy, effort expectancy and social influence as an independent variable or behavioral intention as mediators while usage as dependent variable. The result demonstrated that for education the adoption of social networking sites was influenced jointly by performance expectation, effort expectation or social effect and Behavioural intention of utilizing advanced technology influenced the actual use. The outcomes also revealed that self-efficacy, self-directed learning readiness and motivation consider being important constructs for social networking sites usage and acceptance.

Owusu, Bekoe, Otoo, and Koli (2019) identified the adoption of SNS in terms of educational use by using a sample of 522 respondents. The respondents were the University students of the (UGBS) University of Ghana Business School. The study included perceived usefulness, perceived ease of use, social influence, facilitating conditions and social identity as independent variables and educational use as dependent variable. The study relies on by using the concept of social networking sites that illustrates that social networking sites are the services that based on websites or grant individuals to establish a public or semi-public image among the system that is bounded. The results of the study illustrated that perceived usefulness, perceives ease of use, facilitating conditions and the objectives of social networking sites were considered as the most essential elements that encourage students for the adoption of social networking sites in terms of education. The findings give some important recommendations that will be useful for instructors of universities, administrators and policymakers that are interested in adopting social networking techniques in the class. Based on the above discussion, the following statement is hypothesized;

H_1: *Adoption of Facebook has a positive effect on the purpose of using Facebook*

Purpose and Educational Usage of Facebook

Premadasa, Rathnayaka, Thiranagama, and Walpita (2019) illustrated the remodeled educational usage of Facebook. The essential and effective statistical technique called SEM (structural equation modeling) was used to check the significance and relationship among variables. The study also included pursued usefulness, perceived ease of use, social influence, facilitating conditions, community identification and mobility as the dimensions of adoption which used as independent variable, similarly, purpose has some dimensions like social relations, work-related and daily actively, which used as mediator, while educational usage used as dependent variable with the dimensions of communication, collaboration, material and resource sharing, and interactivity. The results demonstrated that all variables showed positive and significant relationship. Hence, according to hypothesis mobility showed strong effect, however, perceived usefulness, perceived ease of use, social influence, facilitating conditions, community identification and mobility or work-related daily activities also significantly correlate with each other. Moreover, PU, PEU, SI, FC, CI, and MO demonstrated direct and significant influence on the adoption of Facebook while SR, WR, and DA also possess significant and direct effect on purpose of Facebook usage whereas CM, C, RMS, and IR illustrated direct and significant influence on education usage of Facebook. According to the recommendations of the study, the research proves to be beneficial for future through meta- analyzing the technology acceptance model in the context of education.

Premadasa et al. (2019) illustrated the remodeled educational usage of Facebook. The essential and effective statistical technique called SEM (structural equation modeling) was used to check the significance and relationship among variables. The study also included perceived usefulness, perceived ease of use, social influence, facilitating conditions, community identification and mobility as the dimensions of adoption which used as independent variable, similarly, purpose has some dimensions like social relations, work-related and daily actively, which used as mediator, while educational usage used as dependent variable with the dimensions of communication, collaboration, material and resource sharing, and interactivity. The results demonstrated that all variables showed positive and significant relationship. Hence, according to hypothesis mobility shows strong effect, however, pursued usefulness, perceived ease of use, social influence, facilitating conditions, community identification and mobility or work-related daily activities also significantly correlate with each other. Moreover, PU, PEU, SI, FC, CI,, and MO demonstrated direct and significant influence on the adoption of Facebook while SR, WR, and DA also possess significant and direct effect on purpose of Facebook usage whereas CM, C, RMS, and IR illustrated direct and significant influence on education usage of Facebook. According to the recommendations of the study, the research proves to be beneficial for future through meta- analyzing the technology acceptance model in the context of education.

Facebook is considered as a most effective technique in terms of education that possess its shape and different utilities. Social networking sites are social techniques because person utilizes these tools for communication and support, it also used as establishment of content as well as identify and share knowledge and aggregate and modified information.

Figure 1
Conceptual Framework

Sago (2013) examined factors influencing services of social media usage and adoption. The findings showed relationship between usefulness and the usage frequency of services of social media to be significant. The results highlight that frequency of use of services of social media increases as perception of usefulness of service by users' increase. Moreover, the finding also concluded the significant relationship between user enjoyment and frequency of use of service.

Facebook can promote collaborative and cooperative learning. Sharma, Joshi, and Sharma (2016) explored the key determinants that affect the intention of students towards Facebook usage in higher education. The techniques used were structural equation modeling and neural network for analyzing the relationships among variables. SEM was conducted using confirmatory factor analysis. The findings highlight that sharing resources is the most important factor for using Facebook in higher education followed by perceived usefulness, collaboration, enjoyment, and social influence. Further the findings of neural network showed collaboration to be the most important predictor for adoption of Facebook for academic purposes followed by resource sharing, social influence, perceived usefulness, and perceived enjoyment. Following hypothesis developed after the

aforementioned discussion;

H_2: Purpose of using Facebook has a positive effect on the educational usage of Facebook.

Methodology

The present paper employs the deductive approach to examine the role of Facebook adoption on the educational usage of undergraduate students. For that purpose, the data was gathered from 470 undergraduate students of different private and public universities of Karachi, Pakistan. The self-administered research instrument was used to collect the data from the respondents by using non-probability convenience sampling technique. Convenience sampling is appropriate because undergraduate students regardless of private and public universities were targeted as per the researcher's convenience.

Research Instrument

The research instrument used for data collection is adopted. The research instrument was divided into 4 sections. The first section of this survey collects demographic characteristics of Facebook users through six questions. the second section of the survey choses the Facebook adoption as latent variable. The second section of the survey was composed of a 5-point Likert scale with 11 questions to identify, how and why undergraduate students adopt the Facebook platform for education. The third section of the survey employs, a 5 -point Likert scale with 11 questions to collect members' views on the of Facebook in an educational context to find level of communication, Material and Resource Sharing and collaboration within the undergraduates during studies. The forth section of questionnaire explores to identify the purpose of Facebook usage among undergraduates.

To test the proposed conceptual model, PLS-SEM techniques was used. In this study, PLS-SEM is used over CB-SEM because of several reasons. One of the obvious reasons is that the proposed model is complex (having multiple constructs and indicators). There are multiple dimensions of predictor, mediator and outcome variables. Also, the current study is not testing or confirming a single theory. Therefore, PLS-SEM hypothesis testing technique is more relevant over others.

Data Analysis

Composition of the Data

The demographic profile of respondents is summarized in Table 1 including their gender, age, Sector, frequency of Facebook usage. The results (Table 1) show the prevalence of female Facebook users (51.4%) over male users (48.6%). Most Facebook users are 21–25 years old (57.1%) according to the results, 33.8% of students spent 3 to 4 hours on Facebook 25.6% of students spent more than 6 hours on Facebook.

Table 1
Students' opinions on RT

Demographics		Frequency	Percentile
Gender	Male	230	48.6
	Female	240	51.4
Age	18-20	137	29
	21-25	270	57.1
	25-30	65	13.7
Hours	0-1 hours	13	2.7
	1-2 hours	73	15.4
	3-4 hours	160	33.8
	5-6 hours	106	22.4
	More than 6 hours	121	25.6

Table 2
Convergent Validity and Reliability

Constructs	Cronbach's Alpha	Composite Reliability	AVE
Adoption	0.899	0.914	0.386
C	0.793	0.866	0.617
CI	0.852	0.901	0.694
COLL	0.863	0.907	0.709
DA	0.827	0.897	0.743
FC	0.791	0.865	0.615
MRS	0.745	0.854	0.662
PEOU	0.708	0.837	0.632
PU	0.850	0.909	0.770
Purpose	0.907	0.922	0.517
SI	0.658	0.814	0.594
SR	0.833	0.889	0.666
Usage	0.895	0.913	0.490
WR	0.824	0.884	0.655

Before testing the hypothesis, measurement model should be tested. In measurement model, the reliability of research instrument and the validity of the construct should be tested. The composite reliability and Cronbach alpha values determine that the research instrument is reliable. Moreover, the value of AVE describes the convergent validity of the construct. It shows that all the values of AVE are greater than 0.5 (above the benchmark) showing that convergent validity of all the constructs has been established.

There are three ways through which discriminant validity can be determined; those are; cross loadings, HTMT, and Fornell and Larcker. The results indicate the uniqueness of each construct and it means discriminant validity is established.

Discriminant validity for PLS-SEM is another significant method proposed by Henseler, Ringle, and Sarstedt (2015). It is also known as HTMT ratio. In this regard, there has been strong consensus among authors that HTMT ratio should be lower than 0.95 for adequate discriminant validity. Therefore, as shown in the table below, all the variables have less than 0.95 value of HTMT, manifesting considerable discrimination and dissimilarities among latent constructs in the structural model.

Table 3
Heterotrait Monotrait Ratio

Constructs	C	CI	COLL	DA	FC	MRS	PEOU	PU	SI	SR	WR
C											
CI	0.665										
COLL	0.702	0.643									
DA	0.682	0.838	0.649								
FC	0.799	0.563	0.558	0.569							
MRS	0.875	0.659	0.712	0.678	0.795						
PEOU	0.581	0.506	0.561	0.516	0.734	0.611					
PU	0.545	0.475	0.498	0.444	0.674	0.544	0.883				
SI	0.651	0.59	0.635	0.694	0.595	0.617	0.652	0.534			
SR	0.730	0.782	0.688	0.747	0.645	0.728	0.577	0.52	0.595		
WR	0.700	0.704	0.678	0.69	0.645	0.795	0.662	0.633	0.599	0.843	

The third approach that tests the discriminant validity is (Fornell & Larcker, 1981). According to the criteria, the diagonal values of each construct should be greater than their off-diagonal values of other constructs. In this case, it can be concluded that discriminant validity is established. In the current study, it can be seen that all the diagonal values of each variable are greater than the off-diagonal values of other variables. Therefore, it can conclude that discriminant validity according to the Fornell and Larcker (1981) criterion is established.

Table 4
Fornell and Larcker Criterion

Constructs	C	CI	COLL	DA	FC	MRS	PEOU	PU	SI	SR	WR
C	0.786										
CI	0.548	0.833									
COLL	0.582	0.553	0.842								
DA	0.555	0.704	0.547	0.862							
FC	0.633	0.463	0.463	0.461	0.784						
MRS	0.675	0.528	0.577	0.530	0.612	0.814					
PEOU	0.434	0.395	0.439	0.395	0.548	0.446	0.795				
PU	0.446	0.405	0.426	0.372	0.553	0.436	0.686	0.877			
SI	0.469	0.443	0.479	0.513	0.431	0.434	0.445	0.400	0.771		
SR	0.594	0.659	0.583	0.621	0.524	0.575	0.444	0.438	0.440	0.816	
WR	0.568	0.590	0.573	0.570	0.522	0.625	0.507	0.530	0.442	0.699	0.809

Path Analysis

Path analysis indicates, at a glance, which predictors appear to have stronger, weaker, or no relationships with the dependent variable. Following table 6 provides results of path analysis for hypothesis-testing using PLS-SEM and confidence interval of 95 percent. Therein, bootstrapping technique for PLS-SEM has been employed and results were estimated at 5000 subsample bootstrapping and 0.05 statistical significance. Following table represents the reflective construct of the variables.

Table 6 showed that adoption H1 has positively significant relationship with purpose (β = 0.772, p $<$ 0.05). the relationship between adoption and educational usage H2 is also positively significant (β = 0.403, p $<$ 0.05). In addition, the relationship between purpose and educational usage is also positively significant (β = 0.456, p $<$ 0.05).

Table 5
Reflective Constructs

Reflective Construct Adoption	Estimates	SE	T Stat	P Values
Adoption ->CI	0.744	0.028	26.112	0.000
Adoption ->FC	0.803	0.021	38.740	0.000
Adoption ->PEOU	0.786	0.017	45.371	0.000
Adoption ->PU	0.797	0.019	41.879	0.000
Adoption ->SI	0.669	0.035	19.094	0.000
Reflective Construct Educational Usage	**Estimates**	**SE**	**T Stat**	**P Values**
Usage ->C	0.874	0.013	67.163	0.000
Usage ->COLL	0.859	0.016	52.915	0.000
Usage ->MRS	0.846	0.019	44.980	0.000
Reflective Construct Purpose	**Estimates**	**SE**	**T Stat**	**P Values**
Purpose ->DA	0.816	0.020	40.556	0.000
Purpose ->SR	0.903	0.011	82.298	0.000
Purpose ->WR	0.882	0.013	65.889	0.000

Table 6
Hypothesis testing using PLS-SEM

Hypotheses	Estimates	SE	T Stat	P Values
Adoption ->Purpose	0.772	0.022	35.895	0.000
Adoption ->Educational Usage	0.403	0.054	7.513	0.000
Purpose ->Educational Usage	0.456	0.054	8.504	0.000

Mediation Analysis

In the given table 7, the results of mediation analysis are reported. In this study, the mediating effect of purpose is investigated between adoption and educational usage. The results show that purpose mediates the relationship of adoption and educational purpose (β = 0.352, p $<$ 0.05).

Table 7
Mediation Analysis

Mediating Hypothesis	Estimates	SE	T Stat	P Values
Adoption ->Purpose ->Usage	0.352	0.042	8.411	0.000

Predictive Relevance

For assessing predictive power and its relevance in the structural model, Geisser (1975); Stone (1974) suggested blindfolding method using cross-validation redundancy. Therefore, the study has employed blindfolding technique using PLS-SEM at 7 (default) cross-validation cases. Following table 8 provides result of predictive relevance including R-square and using algorithm estimation and Q-square using blindfolding estimations.

Table 8
Predictive Relevance & Accuracy

Constructs	R Square	Q Square
Purpose	0.596	0.286
Educational Usage	0.653	0.297

Table 8 reports the results of predictive accuracy and relevancy. As in this case, both the relevance and accuracy of the all the explanatory variables have been achieved. Results show that R square of educational usage and purpose are 0.596 and 0.653, which are more than 30%, hence it is concluded that explanatory variables sufficiently predict the outcome variable. Whereas, on the other hand, Q square shows the relevancy of the explanatory variables. In this case, Q square of both the variables are 0.286 and 0.297, which is greater than 0, it means all explanatory variables are relevant.

Discussion and Conclusion

The present paper examines the impact of adoption of Facebook on the purpose and educational usage of undergraduate university students in Pakistan. A total sample 470 students were selected to estimate the conceptual model. Structural equation modeling was used to test the hypotheses. Results revealed that the adoption of Facebook has a significant influence on the purpose of Facebook. Also, all the dimensions of adoption of Facebook were significant illustrating that adoption of Facebook was highly explained by all of its dimensions. This could be justified that an individual adopts Facebook due to several reasons like, social influence, ease of use, usefulness, facilitating conditions and community identity. These findings are consistent with the previous researches, such as; Shirazi (2013). After the adoption, the purpose of using that platform has been generated. The purpose could be for social reasons, work related and daily activities. In addition, once the student starts using it for its associated purposes, he can also use it for educational purposes.

Recommendations and Limitations

In the light of aforementioned empirical findings, the present paper suggests several policy implications for the higher education institutes. Facebook should be used as a tool of learning in higher education institutes. For instance, the Facebook features should be used as learning tools instead of Learning Management System (LMS). For that, we need to give awareness to the teachers about the social media and other technological advancement.

This research is also not without limitations. These limitations can further be studied in future. Researchers can expand the existing research by adding more variables in the model, like knowledge seeking intention, etc. In future studies, researches can be more focused on the comparison of the sample, which enhance the clear picture. This research should pay attention to some limitations, and the following suggestions for future

research will be worthy of future efforts in this field. First, the sample for this study is limited to students from a different university in Karachi Therefore, this study can also be applied to other universities in Pakistan. The research is limited to Facebook SNS, and there is room for comparative research on other SNS or similar social platforms, such as WhatsApp, Telegram, etc.

References

Abrahim, S., Mir, B. A., Suhara, H., Mohamed, F. A., & Sato, M. (2019). Structural equation modeling and confirmatory factor analysis of social media use and education. *International Journal of Educational Technology in Higher Education*, *16*(1), 1–25.

Abusbiha, M. I. A., & Mustaffa, C. S. (2014). The relationship between personal factors, facebook intensity and academic performance of youth students in Libya. *Procedia-Social and Behavioral Sciences*, *155*, 104–109.

Ainin, S., Naqshbandi, M. M., Moghavvemi, S., & Jaafar, N. I. (2015). Facebook usage, socialization and academic performance. *Computers & Education*, *83*, 64–73.

Akram, M. S., & Albalawi, W. (2016). Youths' social media adoption: theoretical model and empirical evidence. *International Journal of Business and Management*, *11*(2), 22.

Al-Rahmi, W. M., Alias, N., Othman, M. S., Marin, V. I., & Tur, G. (2018). A model of factors affecting learning performance through the use of social media in Malaysian higher education. *Computers & Education*, *121*, 59–72.

Al-Rahmi, W. M., & Zeki, A. M. (2017). A model of using social media for collaborative learning to enhance learners' performance on learning. *Journal of King Saud University-Computer and Information Sciences*, *29*(4), 526–535.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319–340.

Durak, H. Y. (2019). Examining the acceptance and use of online social networks by preservice teachers within the context of unified theory of acceptance and use of technology model. *Journal of Computing in Higher Education*, *31*(1), 173–209.

Fornell, C., & Larcker, D. F. (1981). *Structural equation models with unobservable variables and measurement error: Algebra and statistics.* Sage Publications Sage CA: Los Angeles, CA.

Geisser, S. (1975). The predictive sample reuse method with applications. *Journal of the American Statistical Association*, *70*(350), 320–328.

Hartman, J., Moskal, P., & Dziuban, C. (2005). Preparing the academy of today for the learner of tomorrow. *Educating the Net Generation*, 6–1.

Junco, R. (2014). *Engaging students through social media: Evidence-based practices for use in student affairs*. John Wiley & Sons.

Owusu, G. M. Y., Bekoe, R. A., Otoo, D. S., & Koli, A. P. E. (2019). Adoption of social networking sites for educational use. *Journal of Applied Research in Higher Education*, *11*(1), 2-19.

Premadasa, H. S., Rathnayaka, R. K. T., Thiranagama, A. W., & Walpita, C. N. (2019). Remodeling the educational usage of facebook in smart-mobile age. *Education and Information Technologies*, *24*(1), 41–61.

Sago, B. (2013). Factors influencing social media adoption and frequency of use: An examination of facebook, twitter, pinterest and google+. *International Journal of Business and Commerce*, *3*(1), 1–14.

Sharma, S. K., Joshi, A., & Sharma, H. (2016). A multi-analytical approach to predict the facebook usage in higher education. *Computers in Human Behavior*, *55*, 340–353.

Shirazi, F. (2013). Social media and the social movements in the middle east and north africa: A critical discourse analysis. *Information Technology & People*.
Stone, M. (1974). Cross-validation and multinomial prediction. *Biometrika*, *61*(3), 509–515.
Venkatesh, V., & Zhang, X. (2010). Unified theory of acceptance and use of technology: US vs. China. *Journal of Global Information Technology Management*, *13*(1), 5–27.