

The Impact of Social Media on E-Learning Behaviors among University Students

Muhammad Noor Al Adwan¹, Mohamed Chettah²

Abstract

This study aims to examine the relationships between the dimensions of Social Media and E-Learning Behaviors (SMELB) in education of Al Ain University Students in United Arab Emirates. A sample of 494 students completed a survey conducted at Al Ain University. The study adopts some methodologies such as Structural Equation Modeling (SEM) technique and Confirmatory Factor Analysis (CFA) to examine the reliability and validity of the measurement, and the structural equation modeling techniques (Amos 20.0) to evaluate the casual model. The findings of the study demonstrate the strong predictive power and explain of students' Behaviors. They highlighted that the relationship between easy communication, improving confidence, lecture sharing, and increasing knowledge have a significant positive and direct impact on E-learning Behaviors (H1, H3, H4, and H5). While, reducing stress has insignificant positive and direct impact on E-learning Behaviors (H2).

Keywords: Al Ain University, E-learning behaviors, social media, United Arab Emirates.

Introduction

Higher education institutions afford a full support for a successful widely distance learning usage all over the world due to the situations taking place everywhere, impressing everyone to use this new education model compared with traditional model, which is totally stopped now temporarily for unlimited period. Ravidly, the era of social media in education institutions becomes so important aspect for E-distance learning as a way of protection. The administrations of this field have immediately taken immediate action to improve this effort, which is must for these organizations connected with education. More than one social media channels in education sector such as Facebook,

¹ College of Communication and Media, Al Ain University, P.O. Box: 112612, Abu Dhabi, UAE, muhammadnoor.aladwan@aau.ac.ae

² College of Communication and Media, Al Ain University, P.O. Box: 112612, Abu Dhabi, UAE, mohamed.chettah@aau.ac.ae

LinkedIn, Twitter, and WhatsApp interact in this field as a medium of a distance learning (Abbas and et al, 2019).

Social media is widely used in the world mostly in communicating, entertainments, fun, and passing leisure time. However, it has recently become more essential in our life, especially, in education. Therefore, the social media is highly utilized to have a good quality of and in education process through distance learning behaviors and practices. Moreover, Thangiah (2018), stated that the social media is a successful tool of communication for the students to gain a knowledge as well as it is also useful for the lecturers or and instructors, and students, based on that the social media is one of a very significant tools in educational institutions.

Furthermore, social media has played a vital role and improved rapidly specially in these days compared with traditional teaching in educational institutions. It has provided many channels to satisfy various audiences to meet their needs. The institutions have a worthy opportunity to invest social media, due to its significant role, to have a remarkable impact on distance learning through reducing stress, increasing knowledge, lecture sharing, improving confidence and conducting communication easily in two-way communication. Many experts exert their efforts to have a good input in this new medium in education, which excluded from this input in the learning process in campuses. Meanwhile, none of the institutions have dissociated and neglected this medium of learning especially these days, which conditionally used due to Corona virus. The current study measures the social media impact on the university students to explore their feedback of this new model during the education process and efforts.

Education and social media experts bet for the success of this mixture of distance learning to be digital during this era and globally used to reach the e-learning behaviors. This study achieves five objectives as follows: 1) to identify the direct significant influence of easy communication on e-learning behaviors, 2) to identify the direct significant influence of reducing stress on e-learning behaviors, 3) to identify the direct significant influence of improving confidence on e-learning behaviors, 4) to identify the direct significant influence of lecture sharing on e-learning behaviors, and 5) to identify the direct significant influence of increasing knowledge on e-learning behaviors.

Literature Review

E-Learning Behaviors

Learning is defined as a change in behavior. However, claiming the change means that one needs to be aware of the learning theory based

on which the behavioral responses are assessed, as well as the type of content to be taught/learned so that the choice of theory is well justified. In terms of theories, there are three learning theories most resorted to when shaping educational content and molding students' behavior, namely behaviorism, cognitivism and constructivism. Behaviorism is setting-orientated, defines behavior-related objectives that can be measured, observed and assessed. For the behavior to become a learned one, it takes a number of stimuli followed by reinforces to ensure its manifestation and rapid extinction. The educational programs that employ behaviorism as a theory underpinning their goals and objectives are characterized by a "systematic, individualized, but program-controlled manner" (Buzzetto-More, 2007; Mattayaphutorn, Tam, & Jariyapan, 2021).

E-learning has acquired a wide set of synonymous phrases like distance learning (if only the learner's contribution and effort are the focus), distance education (emphasizing both the teacher's and student's efforts) (Moore et al., 2005; 2012), mobile learning/m-learning (if learning is undertaken via mobile devices) (Retta, 2010), online learning, distributed learning, home learning, or Internet based learning to name just the most used. A simple definition of e-learning is that of education (that is both the teaching and learning processes) delivered via the Internet, extranet or intranet (Mealy et al., 2000; Service, 2021; Strang & Vajjhala, 2022).

Social Media

The social media defined as new forms of media that involve interactive participation. There were two distinct categories for media based on the aging criteria as the broadcast age and the interactive age. In the first category the broadcast age, centralized media entity exemplified by the radio, television station, newspaper, and/or movie production studio broadcasted the messages/feedback/responses for diverse audiences. The messages/feedback/responses delayed, impersonal and indirect. The typical mediated communication (personal level) through individual letters and phone contacting, or much higher level (massive scale) via family newsletter. (Manning, 2014).

Andreas Kaplan and Michael Heinlein has accomplished most of the known definitions for social media. Whereby they defined social media as congregation of applications and internet implements established on the underlying network and automated establishments which approve the sharing, creation, and the trade of customer-produced content and data for the social media users. The variety of users including university students can utilized the social media to exchange information (two way communication), ideas, beliefs, and assumptions and create contacts through the social networking

(Penni, 2017). Consequently, users are able to design content, share information (videos, images, games), communicate, coordinate, establish mutual efforts, collaborate, connect, with counterparts. The social media is advancing with diverse websites, wiki pages, video-gaming, photo-sharing, digital media, and others. Apparently, the engagement in social media via versatile social networking and digital media have great impact on the social interacting of individuals, communications, building brands and generation of future prospects (Berezan et al., 2018).

The Relationships between Social Media and E-Learning Behaviors

This study focuses on the impact of social media on e-learning behaviors among university students. Further to how inflected in education level as one of the most important role in this era using many channels to cover all student's needs, on the other hand, the use and caution of social media for using during their study by parents and educational students.

Abbas et al, (2019), conducted a study on students (1000, 82% response rate) from Pakistan universities in five regions focused on the social media influence on the learning behavior for sustainable education. Nearly two third (65%) of the sample showed that social media plays an essential role in student university learning and the rest of the sample proved social media is not fit with them in learning. Meanwhile, the result of their study was significant for social media as a medium of learning in Pakistan institutions, which shows an increase of the knowledge and reduces stress among the students.

Moreover, students using social media are the most, while they affect their study time for entertainment use, weak grammar and spelling mistakes when socializing on social media as well as stealing their consideration from their educations (Ndaku, 2013).

Inya (2017), study titled influence of social media on public relations practices in universities in South-East, Nigeria states that social media has taken place on traditional media in their public relations work at their organization using Blogs, Facebook, and Instagram. This is mostly preferred by the students as a medium of easy communication and improve confidence to have a good behavior of e-learning. Another study asserts that the public relations and employee performance in Nigerian Institutions of higher Learning. The management, staff and employees contribute to realizing the goals and objectives of the organization, while the academic learning marks such institutions as extraordinary. The public relations facilitates the relationship between

the organization itself and its internal and external public. In the future, an exceptional type of public relations practice accomplished of addressing the representative needs of the academic staff who are openly involved with the students.

Alsaif (2016), investigates the impact of social media on students, and evaluates of various impacts of social media on students. While the result was significant, proved that social media has its impact on the life of students including their academic performance, social behavior, health and privacy issues. Further, the study confirmed the lectures sharing, reducing stress, improving confidence and increasing knowledge among students in their efforts in performing the e-learning performance and behaviors. Mohamed (2015) conducted a study of social media and public relations among public relations students in the UAE, the sample was 200 undergraduate public relations students. The study showed the outlines of social media usages by students in UAE, which explore the students' attitude towards using social media. This indicated that the social media mostly used by students for friendship and entertainment dedications rather than for educational use.

On the other hand, Devi & Lakshmi (2019), proofed that there is a positive relationship between the variables of current study clearly appealed increase knowledge, lectures sharing, and easy communication. Moreover, they mentioned that social media is a tool hurriedly changing the communications and the effect on teaching and learning environment and its applications can reinforce class materials, positively swayed deliberations, cooperative work, and excellent technology to motivate alliance, knowledge structures, intelligent skills and learning behaviors among the students. In addition, Abraham and Saini (2015) have shown that the social media make the fastest growth in all fields and its increasing day by day. In addition, the people in general rely on social media more than on face-to-face communication utilized for very large public segmentation; its use in education makes the relationship easier and achievable between the users.

Moreover, a study conducted by Raut and Patil (2016), indicated that the use of social media is rapidly increasing for the past few years. Not only used by the workers but also there is a dramatic and heavy rise in the use of social media by the students. Which creates positive impact on the society with the help of various developed applications are available and can be used easily, allow users to converse and interact with each other, to create, edit and share new forms of textual, visual and audio content.

On the other hand, Faizi and et al (2013), exposed online social implements have many educational benefits through social media to

make easy communication and interaction between the students and teachers and vice versa. That proved in their study where the students are more capable to communicate in virtual classes in distance learning. Where students feel more confident with that and they can express their self easily compared with face-to-face mood. Consequently, e-learning destination can increase their knowledge.

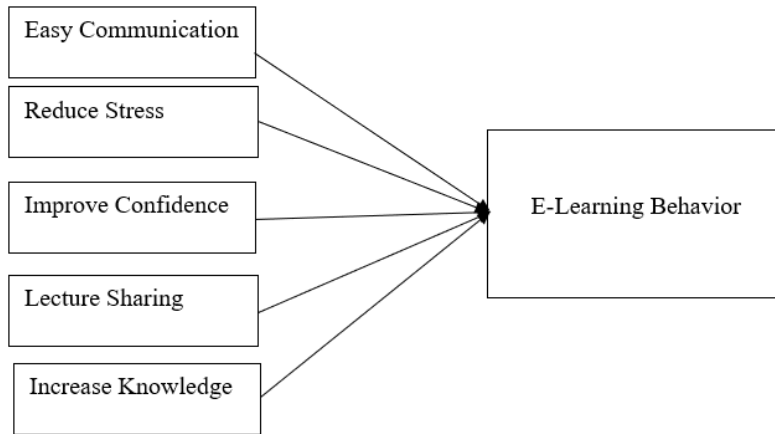
In general, there is a relationship between social media as an important tool of e-learning and its impact in consuming an easy communication on e-learning behaviors, which supported by (Al-Mukhaini, et al, 2014; Faizi, et al, 2013; Raut and Patil, 2016; Abraham and Saini, 2015; Devi, et al, 2019; Dumpit and Fernandez, 2017; Mohamed, 2015; Inya, 2017). Additionally, there is an impact relationship of improving confidence through using social media effecting positively the relationship with e-learning behavior (Faizi, et al, 2013; Abraham and Saini, 2015; Dumpit and Fernandez, 2017; Mohamed, 2015; Alsaif, 2016; Nguru and Ibrahim, 2018; Inya, 2017; Abbas, et al, 2019).

Many studies stated that social media has a strong impact especially in reducing stress among users compared with traditional way of teaching, there is a positive relationship toward e-learning behaviors (Dumpit and Fernandez, 2017; Alsaif, 2016; Nguru and Ibrahim, 2018; Abbas and et al, 2019). Moreover, based on literature review, there is a positive and a good impact of social media in utilizing lecture sharing in online courses, which achieves a good impact on e-learning behaviors (Devi, et al, 2019; Dumpit, and Fernandez, 2017; Alsaif, 2016; Nguru and Ibrahim, 2018; Abbas, et al 2019). Meanwhile, the social media has been considered to fit and increase the knowledge and it has a positive impact on e-learning behaviors (Devi, et al, 2019; Dumpit and Fernandez, 2017; Alsaif, 2016; Inya, 2017; Abbas and et al, 2019).

Theoretical Framework

The framework of this study shows the relationship between the independent variable of social media and five dimensions, which are easy communication, reduce stress, improve confidence, lecture sharing, and increasing knowledge. Additionally, one dependent variable is E-learning behaviors among Al Ain University students in UAE. As shown in the following figure proposed by (Abbas et al., 2019; Dumpit and Fernandez, 2017), Figure 1.

Figure1: Social media and E-learning Behaviors Model (SMELB)



METHODOLOGY

Study Design and Methodology

According to Bakar (2001), questionnaires obtain primary data of a preeminent suitable study based on experiment, observation and survey. This study chooses a systematic random sample in which 850 students identified from Al Ain University in UAE. The sampling frame for this study consisted of students in Al Ain University, who are enrolled till end of the second semester in academic year 2019/2020, (September 2, 2019 until August 20, 2020) were 5200 students. We have distributed 850 questionnaires among students using online learning Moodle. Where, 200 did not reach the target students and 146 were incomplete. However, the 504 responses dataset coded and saved into SPSS version 17.0. Outlier results show that there were 10 datasets were deleted due to Z-score value more than +3 or less than -3 (Hair et al., 2006). Therefore, 494 responses used for subsequent analysis, giving a response rate of 58.0%.

In the current study the questionnaire was divided into nine parts: - 1. demographic variables (5 items); type of using social media (5 items), the mostly social media channels you prefer to use (9 items), 2. easy communication (7 items), 3. reduce stress (5 items), 4. improve confidence (5 items), 5. lecture sharing (6 items), increase knowledge (6 items), and 6. E-learning behaviors (6 items) by (Abbas et al., 2019; Dumpit and Fernandez, 2017).

Hypothesis formulation

Our hypothesis was formulated based on the below definitions: -

- H1 Easy communication, is related positively with e-learning behaviors
- H2 Reduce stress, is related positively with e-learning behaviors
- H3 Improve confidence, is related positively with e-learning behaviors
- H4 Lecture sharing, is related positively with e-learning behaviors
- H5 Increase knowledge, is related positively with e-learning behaviors

Discussions

Profile respondents

329 (66.6%) of the respondents were female and 165 (33.4%) were males. 53.2% of the respondents aged between 36-41 years old. Most of the respondents were under-graduate 78.7%, while, 21.3% were postgraduate. 52% prefer to use social media in e-Learning (Microsoft teams) in their study, 26.5% WhatsApp, 11.7% Instagram, 4.7%, 2.1%, YouTube, and Twitter users were 3%. Finally, 73.1% of the respondents use e-Learning between 3 – 5 hours per day at 15:00 – 20:00 PM.

Descriptive statistics of variables

Overall, the results in Table 1 shows that mean score of easy communication and lecture sharing are considered very high (3.7). In contrast, improving confidence is relatively low with mean score (3.5), which means that the student's perception towards e-learning behaviors need more of confidence improvement.

Reliability test

We have used test of composite reliability of each measure developed by Werts et al. (1974), which measures the reliability of a construct in the measurement model. It is assessed using the criteria set by Nunnally (1978) for assessing reliability coefficients. The summary of the composite reliability based on the standardized factor loadings obtained from the final revised structural model shows that all constructs have an acceptable value above 0.60 (Nunnally, 1970).

Composite reliability results indicate that the measurements of all observed variables considered as reliable and acceptable, while most of the constructs have a value more than .83. This result provides strong support for the construct components. Thus, the results in Table 1 show that provides comprehensive reliability results for each of the study constructs. The composite reliability calculated by use of the following equation:

$$\text{Composite reliability} = \frac{(\sum \text{tan dizedloading})^2}{(\sum \text{tan dizedloading})^2 + \sum \varepsilon_j}$$

(Source: Hair et al. 1998:624)

Table 1 Descriptive statistics of variables and reliability results.

Variable name	Original items	Total mean	Items after CFA	Composite Reliability
Easy communication	7	3.7	3	.86
Reduce stress	5	3.6	2	.88
Improve confidence	5	3.5	3	.78
Lecture sharing	6	3.7	2	.76
Increase knowledge	6	3.6	4	.83
E-learning behaviors	6	3.6	4	.88
Total items	35		18	

Keys

Confirmatory Factor Analysis: CFA,

The CFA measurement model estimation is the first step of Structural Equation Modelling (SEM). The CFA determines whether the number of factors and the loadings of items on them conform to what is expected based on the pre-established theory of scale assessment. The SEM techniques used to perform the CFA. The AMOS software 20.0 used to calculate whether the proposed factor solutions and the model fit the data. As mentioned earlier, structural equation modeling (SEM) considered a family of statistic models that looks for details concerning the relationships among multiple variables (Hair et al., 2006; Yongmei et al., 2021; Mandmaa, 2021; Buba et al., 2022). A confirmatory factor analysis (CFA) first used to confirm the factor loadings of the six constructs (easy communication, reduce stress, improve confidence, lecture sharing, increase knowledge and e-learning behaviors).

As a general rule of thumb Hair et al. (2006), provides a guideline to interpret the factor loading, where factor loadings with a value of +.50 or greater are considered very significant; a loading of +.40 is considered most important; a loading of +.30 is considered significant. In this study, all items have a factor loading of more than .60, suggesting that the items correlate very significantly to the factor itself.

Table 2 Factor loading results of constructs

Variables	Code	Factor loading
Easy communication	ECOM2	.64
	ECOM3	.78
	ECOM4	.78
Reduce stress	RSTR1	.74
	SSTR3	.75
Improve confidence	IMCO1	.80
	IMCO2	.90
	IMCO3	.79
Lecture sharing	LSHR1	.72
	LSHR2	.83
Increase knowledge	INKW2	.70
	INKW3	.71
	INKW4	.68
	INKW6	.35
E-learning behaviors	ELBH1	.59
	ELBH4	.84
	ELBH5	.86
	ELBH6	.44

Having discussed the confirmatory factor analysis (CFA), it is realized that the regression estimates or factor loading of all observed variables or items are adequate from 0.35 to 0.90 as shown in Table 2. According to the sampling size, the factor loading for each observed variable or item should be above 0.30 (Hair et al., 2006). This results indicates that each the constructs conforms to the construct convergent validity test.

Goodness of Fit Indices of Generating Model (GM)

The results of goodness-of-fit for the generating model shown in Figure 1. The value of chi-square is 268.300 with 120 degrees of freedom. The GFI is 0.946, the AGFI is 0.923, IFI is 0.960, TLI is 0.948, NFI is 0.928, CFI is 0.959, RMSEA is 0.049, and the CMIN/DF of 2.203 < 3. The results of goodness-of-fit for generating model are acceptable as being above recommended values (Hair et al., 2006).

Hypothesis Testing of Generating Model

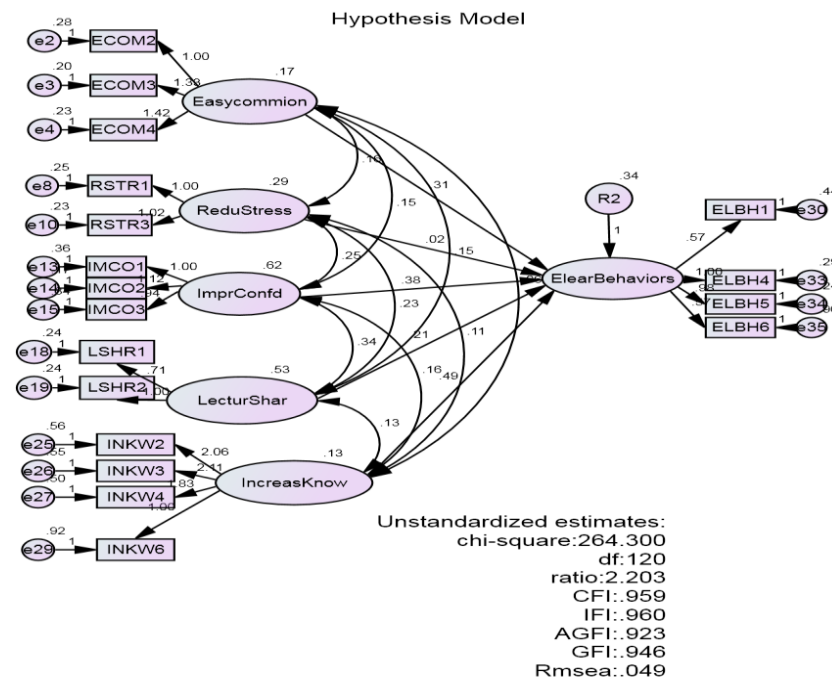
A direct effect represents the effect of an independent variable (exogenous) on a dependent variable (endogenous). From Figure 2 and Table 3, it shows that the hypotheses test, in determining the significance of each path coefficient, estimate of regression weight, standard error of regression weight, and critical ratio for regression weight, (C.R= dividing the regression weight estimate by the estimate of its standard error gives) were used.

Table 3 presents each parameter's C.R., Estimate and S.E of the Generating Model. Hence, it is found that the easy communication, improve confidence, lecture sharing, and increase knowledge have a significant positive and direct impact on e-learning behaviors (H1, H3, H4, and H5). While, reduce stress has insignificant positive and direct impact on e-learning behaviors (H2).

Table 3: Direct Hypotheses Testing Result of Generating Model

H.	Regression Weights From	To	Estimate	SE	C.R.	P	Hypothesis
H1	ECOM	ELBH	.307	.155	1.985	.047	Yes
H2	RSTR	ELBH	.016	.147	.107	.915	No
H3	IMCO	ELBH	.377	.068	5.541	***	Yes
H4	LSHR	ELBH	.207	.080	2.600	.009	Yes
H5	INKW	ELBH	.486	.167	2.925	.003	Yes

Figure 2: Generating social media and E-learning Behaviors Model (SMELB)



Conclusion

It was clear to the researchers that achieving the above objectives should help and development academic research to describe, understand and explain the status of E-learning in Al Ain University in UAE. This research examined the effect of dimensions of social media and E-learning behaviors among Al Ain University students. The results showed the positive and direct impact between easy communications, reduce stress, improve confidence, lecture sharing, and increase knowledge and E-learning behaviors, after collecting and analyzing the data using Amos 20.0. Paths analysis showed that the most of hypothesis had a significant positive and direct impact on E-learning behaviors, easy communication, improve confidence, lecture sharing, and increase knowledge had a significant positive and direct impact on E-learning behaviors. While, reduce stress had insignificant positive and direct impact on E-learning behaviors. This means that the E Learning program is affected by a number of factors, such as improving confidence, exchanging lectures, and increasing knowledge. Therefore, the university must pay more attention to the other factors that influence distance education in the future.

Bibliography

- Abraham, J & Saini, C (2015). Using Social Media for Educational Purposes: Approaches and Challenges. Conference: International Educational conference 2015 Learning Technologies in Education. Volume: Excel India Publishers pp 484-489
- Al-Mukhaini, E, M; Al-Qayoudhi, W. S; & Al-Badi, A. H (2014) Adoption of Social Networking in Education: A Study of the Use of Social Networks by Higher Education Students in Oman. Oman Journal of International Education Study – Second Quarter, Volume 10, Number 2
- Alsaif, A. (2016). Investigate The Impact of Social Media on Students. A dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Science (Honours) in.
- Bakar, M.J. (2001). Selecting a research methodology. The Marketing Review 1 (3):373-397
- Berezan, O.; Krishen, A.S.; Agarwal, S.; Kachroo, P. The pursuit of virtual happiness: Exploring the social media experience across generations. J. Bus. Res. 2018, 89, 455–461. [CrossRef]. Business Information Systems (St20047199). Department of Computing & Information Systems. Cardiff School of Management. Cardiff Metropolitan University.
- Branzuela, D. G; Bete, K. M; Dela Pena, P. J; Sagarino, C. T and Maneja, J. M (2019). Effects of Social Media Usage oo the School Performance of the Grade 12 Senior High School Students. <https://www.studygate.net/publication/330466568>

- Buba, A., Somasundara, J. W. D., Adamu, I., & Samuel, D. (2022). Vocational Training and Youth Empowerment in Nigeria: Evidence from Informal Sector Operators' Activity in Gombe Metropolis. *American Journal of Social Sciences and Humanities*, 7(2), 144–153. <https://doi.org/10.55284/ajssh.v7i2.799>
- Buzzetto-More, Nicole A. (ed.) (2007). *Advanced Principles of Effective e-Learning*, Informing Science Press:USA, p. 2.
- Devi, K. S; Gouthami, K; & Lakshmi, V. V (2019). Role of Social Media in Teaching – Learning Process. *JETIR* January 2019, Volume 6, Issue 1 www.jetir.org (ISSN-2349-5162)
- Faizi, R; El Afia, A & Chiheb, R (2013). Exploring the Potential Benefits of Using Social Media in Education. *iJEP – Volume 3, Issue 4*, <http://dx.doi.org/10.3991/ijep.v3i4.2836>.
- Hair, J., Anderson, R., Tatham, R.L., & Black, W.C. (1998). *Multivariate data analysis*, (5th ed.), NJ: Upper Saddle River, Prentice-Hall.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis* (6 ed.): Prentice Hall.
- Inya, A. E (2017). Influence of Social Media on Public Relations Practices in Universities in South-East, Nigeria. *Global Journal of HUMAN-SOCIAL SCIENCE: A Arts & Humanities – Psychology* Volume 17 Issue 3 Version 1.0 Type: Double Blind Peer Reviewed International Study Journal Publisher: Global Journals Inc. (USA) Online ISSN: 2249-460x & Print ISSN: 0975-587X.
- Mandmaa, S. (2021). How to Promote Personal Financial Education - Findings from Finnish University Students' Financial Literacy Study. *International Journal of Educational Technology and Learning*, 10(1), 8–25. <https://doi.org/10.20448/2003.101.8.25>
- Mahmoud, M. A; Abu Ead, Y. N; & Al Adwan, M. N (2019). A Paradigm for Employing Social Media to Achieve Sustainable Development Objectives. *International Journal of Innovation, Creativity and Change*. www.ijicc.net Volume 8, Issue 9, P 324-331.
- Manning, J. (2014.) Social media, definition and classes of. In K. Harvey (Ed.), *Encyclopedia of social media and politics* (pp. 1158-1162). Thousand Oaks, CA: Sage.
- Mattayaphutrong, S., Tam, B., & Jariyapan, P. (2021). Macroeconomic impact of mandatory retirement age policy to population aging in Thailand. *Cuadernos de Economía*, 44(126), 34-44. <https://doi.org/10.32826/cude.v1i126.504>
- Mealy, L.; Loller, Bob. (2014). *Expanding the Training Classroom Through Technology: A Collection of Articles by the Pioneers of E-Learning*, Rector Duncan & Associates: USA, p. 3.
- Mohamed, H. S (2015). The Use of Social Media Among Public Relations Students in the UAE. *International Journal of Customer Relationship Marketing and Management*, 6(2), p 15-30.
- Moore, Michael G.; Kearsley, Greg. (2005; 2012). *Distance Education: A Systems View of Online Learning*, Wadsworth/Cengage Learning: USA, p. 2. [2]

- Ndaku, A. J. (2013). Impact of Social Media on the Students' Academic Performance in Ghana. *Networking* 18, (5) pp.6, 275-285.
- Nguru, M. N & Ibrahim, A. M (2018). Public Relations and Employee Performance in Nigerian Institutions of Higher Learning. *Informasi: Kajian Ilmu Komunikasi*-ISSN (p) 0126-0650; ISSN (e) 2502-3837 Vol. 48. No. 2, P 267-279. doi: <https://doi.org/10.21831/informasi.v48i2.21972>
- Nunnally, J. (1970). *Introduction to Psychological Measurement*. New York: McGraw-Hill.
- Nunnally J.C. (1978). *Psychometric Theory*, (2nd ed.). New York: McGraw-Hill.
- Penni, J. The future of online social networks (OSN): A measurement analysis using social media tools and application. *Telemat. Inform.* 2017, 34, 498–517
- Raut, V & Patil, P (2016). Use of Social Media in Education: Positive and Negative impact on the students. *International Journal on Recent and Innovation Trends in Computing and Communication* ISSN: 2321-8169 Volume: 4 Issue: 1, p 281 – 285
- Retta, Guy. (ed.) (2010). *Mobile Learning: Pilot Projects and Initiatives*, Informing Science Press: USA.
- Service, R. (2021). Cities of consumers: a reading of the 2011 English riots. *socialspacejournal.eu*, 21(1), 53-67. <https://bibliotekanauki.pl/articles/1939479.pdf>
- Strang, K. D., & Vajjhala, N. R. (2022). Testing risk management decision making competency of project managers in a crisis. *The Journal of Modern Project Management*, 10(1), 52-71. <https://doi.org/10.19255/JMPM02904>
- Thangiah, R (2018). *Social Media on Education*. Conference: National Conference on Impact of Social Media on Education in the Present Scenario. At: Krishna College of Education, Tiruchengode. Volume: 1
- Yongmei, H., Que, Z., & Zhongyi, Z. (2021). Prosocial Behaviour and its Relevant Factors among Undergraduates. *American Journal of Education and Learning*, 6(1), 16–27. <https://doi.org/10.20448/804.6.1.16.27>
- Werts, C. E., Linn, R. L., & Joreskog, K. G. (1974). Interclass reliability estimates: testing structural assumptions. *Educational and Psychological Measurement*, 34, 325-347.