Critical Factors of E-Learning Adoption and Acceptance in Pakistan: A Literature Review

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Abstract—**This review paper examines the prior studies on critical factors of e-learning adoption in Pakistan. The search terms identified 40 papers reporting 25 conceptual and qualitative and 15 quantitative evidence about the e-learning adoption and critical factors that may influence the adoption of e-learning in Pakistan. The findings revealed that modern paradigm shift requires the in-depth analysis of government policies, institutional and management role, students and faculty attitude, social norms, cultural values as well as technological advancement. These factors may directly or indirectly affect the intention of students towards e-learning adoption. The lack of quantitative evidences illustrate that policy makers, practitioners and researchers need to pay attention for further research of identifying and analyzing the critical factors which enhances the e-learning adoption in Pakistan.**

Keywords-e-learning; adoption; acceptance; success; factors

I. INTRODUCTION

E-learning is an amalgamated concept taken from computer science, information technology, education and psychology defined by academics, researchers and practitioners as an information system used to deliver knowledge (in the form of text, audio and video) via intranet, extranet, internet, interactive TV or satellite among learners [1, 2]. In another context, e-learning provides and disseminates information used for corporate training - such as training in technological skills in order to improve performance within an organization [3]. With the rapid growth of information and communication technologies, e-learning is the most promising medium of learning and teaching in the educational system. The advent of technology in the traditional structure of education has reshaped the teaching and learning paradigm. E-learning is the new paradigm. In the era of knowledge management and dissemination, e-learning has proven to be a cost-effective solution of delivering knowledge irrespective of time and geographical boundaries [4]. In addition, this learning approach has increased the interaction and communication of students not only amongst themselves but also with their instructors as well [5]. As a result, e-learning is growing at an astonishing rate among educational institutions to gain the maximum benefit of this new paradigm [6].

With technological advancements, e-learning is proving to be the most favorable medium of communication and learning irrespective of geographical boundaries. The developed countries showed a significant progress in e-learning adoption and acceptance. Although e-learning systems offer great flexibility in learning, teaching and communication, they also present numerous challenges that would significantly affect their continuous use [7]. The basic measure of successful implementation in e-learning systems depends on the adoption, acceptance and continued use [8]. Student acceptance and continued use is essential in the implementation of e-learning [8-9]. It should be noted that the dropout rate in developed countries is 20-40% [10-11]. E-learning, in many institutes, is facing numerous challenges like administrative, organizational, technological and human aspects that highly impact the e-learning continuous intentions. These challenges must be identified and explored to overcome the failure rate of e-learning among students. It is vital to understand the students' needs, investigate the external factors and encounter hitches that may impact on the adoption, acceptance and intention towards e-learning [12]. In addition, students are unable to take advantage of these systems unless they are willing to use them. The effectiveness and efficiency of e-learning systems depend on students' attitudes, adoption and acceptance of modern technology [13-16]. Therefore, it is essential to explore factors that elucidate students' acceptance, intention and attitude towards using e-learning systems. Prior use of technology, instructor attributes, institutional and management support and environment of e-learning are the frequently discussed critical factors in context of e-learning [17-20].

With the benefits of integrating e-learning in HEIs, there are numerous limitations to incorporate ICT with the traditional learning. Poor technology infrastructure, lack of business strategies, students' frustration against web based education and rapid change in the technology may cause failure to students' acceptance of technology and technology continuance [12, 21].

The critical success factors are evaluated as external variables in e-learning adoption and acceptance. Furthermore, it has been stated that there is no universal model for e-learning adoption [22, 23]. The adoption and acceptance is influenced by the contextual, cultural, social and technological differences of countries [22, 24]. The acceptance and refusal of technology adoption may depend on culturally dependent contextual factors [25].

II. E-LEARNING STATUS IN PAKISTAN

The penetration of ICT in the educational system has alleviated online learning in developed countries, as they try to cope with the new technology. Pakistan is one of the countries trying harder to uplift the education system using modern technologies. The Government of Pakistan (GoP) has amended regulatory settings to encourage growth of the ICT by ensuring the availability of internet in the country. The population of Pakistan is 170 millions and the adult literacy rate is 58%. In fact, the progress made in the higher education sector of Pakistan has not been encouraging for the past few decades. Higher education faces numerous problems in this regard. The five year ranking of Global Competitiveness Index (GCI) is presented in Table I. According to the ranking, higher education & training has achieved a below average score. Furthermore, their technology readiness is also below average. Basic and higher education access has been continuously defied in the country. Basically, education is given low priority with an expenditure of only 2% of the Gross Domestic Product (GDP).

TABLE I. GCI RANKING OF PAKISTAN

Year	Overall Rank/ Total economies	Higher Education & Training		Technology Readiness	
		Rank	Score (1-7)	Rank	Score (1-7)
2011-2012	118/142	112	3.01	115	2.94
2012-2013	124/144	124	2.99	118	2.90
2013-2014	133/148	129	2.76	118	2.90
2014-2015	129/144	127	2.8	114	2.80
2015-2016	122/138	123	2.91	119	2.73

Pakistan's educational facts are poor and e-learning in higher education institutes (HEIs) remain at the early stages of its development and implementation. In this regard, the GoP is trying hard to provide quality education in both urban and rural areas. Furthermore, the GOP and the Ministry of Education have invited universities to establish learning management systems.

III. OBJECTIVES OF THE STUDY

This paper is mainly descriptive in nature, as the authors were interested in identifying the status of e-learning in Pakistan, underutilization of modern technologies and the literature gap that exist. Thus, by conducting a systematic literature review on e-learning adoption and critical factors of adoption in Pakistan, we will contribute to both the policy makers in HEIs and researchers. The policy makers in HEIs will be facilitated to unfold the critical success factors.

IV. RESEARCH QUESTIONS

A) E-learning adoption and acceptance in Pakistan

A questionnaire was used to provide hard evidence to provision the adoption and acceptance of e-learning in Pakistan. This review forms on the basis of research carried out in the domain of e-learning concepts, adoption and acceptance predominantly in Pakistan.

B) Critical success factors of e-learning adoption in Pakistan

The next question arises whether the critical success factors of e-learning adoption and acceptance in Pakistan is measured (Table II).

TABLE II. TOTAL NUMBER OF PAPERS IN THE CASE OF PAKISTAN

Items	Total number of papers searched	Total number of papers in case of Pakistan
A	2840	40
B	1930	25

V. DATA COLLECTION

A) Database Searched

This research intends to assess the research published on adoption of e-learning in Pakistan and the critical factors that may influence the adoption in Pakistan. Science Direct, Emerald, Elsevier, IEEE, ACM and some international and local journals are identified as relevant databases. The databases were searched from 2001 to 2016.

B) Search Terms

The search term that was used included terms for e-learning adoption in Pakistan and critical success factors of e-learning adoption in Pakistan. This search term help to determine the scope of the study since many of studies include e-learning adoption, but more specific criteria "Pakistan" was used. We identified the total publications in the specific domain, types of publication (Literature review, Conceptual and qualitative , quantitative evidences, case study) and types of data analysis techniques used (Exploratory Factor Analysis, Confirmatory Factor Analysis, Structural Equation Modelling).

C) Selection of papers for inclusion in the review

A number of further criteria were specified to select appropriate studies for inclusion in the review. To be included in the review, papers had to refer to (a) e-learning adoption in Pakistan and (b) critical success factors of e-learning adoption in Pakistan. Moreover, 40 papers met with the inclusion criteria and were identified as relevant to the current study. Table III illustrates the databases searched along with the number of papers in the case of Pakistan.

VI. DATA ANALYSIS

A) Yearly publications

As presented in Figure 1, no publication focusing on Pakistan was found from 2001-2005. This trend changed in 2006-2010 and 7 publications were found. The trend of e-learning in Pakistan has noticeably changed for the last six years and the 33 of publication was recorded in 2011-2016.

This increasing trend clearly shows the significance of e-learning in Pakistan. On the whole this increasing trend in the publications highlights the awareness and importance of this area among the researchers and practitioners.

B) Types of publication

In this section, the authors classify the recorded list of 40 papers based on the publication type. The data presented in Figure 2 demonstrate that many of the publications are conceptual and qualitative research papers, followed by the limited number of research papers based on quantitative analysis. The total conceptual and qualitative papers are 25 and the quantitative evidences in this context are 15 in number. This limited number of publications clearly depicts that this growing trend of technology need attention of researchers and practitioners. Critical success factors of e-learning adoption should be identified and tested to successfully implement e-learning in Pakistan. Table IV depicts the quantitative evidences in the case of Pakistan.

TABLE III. NUMBER OF PAPERS MEETING INCLUSION CRITERIA

Database Searched	Total number of papers searched	Number of papers in case of Pakistan
Science Direct	73	1
Emerald	6	2
Elsevier	25	0
IEEE	110	0
ACM	127	0
Other Journals (International & Local)	44	37
Total		40

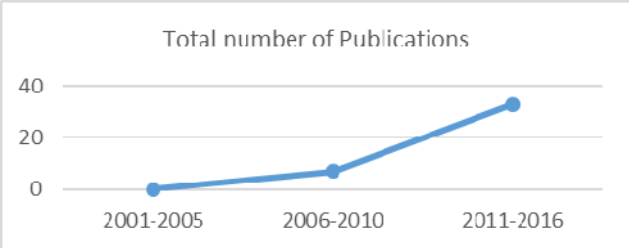

Fig. 1. Total number of publications

Fig. 2. Types of Publications

VII. DISCUSSION

E-learning adoption and acceptance, in Pakistan is in the rudimentary stages of its development [26-28]. The literature shows that Pakistan is also experiencing diverse issues in the successful implementation of e-learning. Demographic factors, social factors, non-compliance with the system, infrastructure, and lack of experienced faculty, internet access, cultural and political concerns are the immense hurdles of e-learning implementation in Pakistan [22, 29-30]. Moreover, the development and implementation faces numerous challenges. The socio-economic situations, technological aptitude, and personality traits of individuals have been identified as great hurdles in e-learning adoption and acceptance. Researchers have paid lot of attention in exposing the hurdles of implementing e-learning in Pakistan. In [31], authors reported that the GoP is overwhelmingly developing and implementing ICT infrastructure without evaluating the realistic need and utilization in respective sectors.

In the case of Pakistan, it is identified that successful integration of ICT in HEIs demands that critical factors should be analyzed and merged into a locally developed model of technology adoption [38]. To investigate the numerous challenges faced by Pakistan in the deployment of e-learning systems a research study was conducted in a private university in Pakistan to identify the barriers and issues in successful adoption of e-learning [58]. The study concluded that computer access, technical language, and privacy issues are the major challenges. In another study, it was emphasized that hardware and technology support, teachers' and students' intention to use e-learning systems, and a knowledge and communication gap among stakeholders (users, developers, and policy makers) may lead to the failure of implementation and policy processes [29]. Among all the related concerns, the pre-requisite for policy makers, practitioners, experts, and system developers is to analyze the factors that may significantly affect students' attitude and positively influence their continued use of e-learning systems. Furthermore, an investigation found that there is no universal model for e-learning adoption as acceptance and refusal may depend on contextual factors that are culturally dependent. In this study, it was also highlighted that the users' organizational characteristics, social environment, and ICT-policies of Pakistan are different from any other country [22].

In addition, the success of e-learning systems does not depend on the availability of technology. The problem arises when the system is not designed from the students' perspective due to differences in terms of culture and social impact [36]. Another study explored how one of the reasons for low adoption and acceptance is poor local research [35]. It is highly necessary to record users' views and requirements according to the local context for the successful implementation of e-learning systems. Some experts also highlighted the need to work on the theoretical and conceptual framework of e-learning adoption in the educational sector [59]. Moreover, experts identified that understanding and assessment of human requirements in the planning and implementation processes of e-learning are critical for the government and policy makers [34]. Another study identified low student motivation, shortage

of qualified faculty, lack of educational facilities, and access to higher education as the major problems in Pakistan [25]. Some of the studies present the quantitative facts in adoption and acceptance of e-learning. Authors in [37] investigated the cultural factors, course contents and human-computer interaction. The results revealed that the medium of instruction affects learner outcome whereas computer interaction should be considered while designing the system.

TABLE IV. QUANTITATIVE STUDIES OF PAKISTAN

Reference	Critical Success Factors	Target audience
[45]	• Cultural • Power distance • Uncertainity avoidance	Faculty
[46]	• Information quality • System quality • Service quality	Student
[47]	• Synchronous mode • Asynchronous mode	Student
[48]	• Technology quality • Usefulness	Student
[49]	• Cultural • Management support • Subjective norm • PU & PEOU	Faculty
[25]	• Cultural • Personal • Social • Technical • Institutions	Domain experts
[50]	• Categorization of critical factors • Software • Technical • Institutional • Cultural • Personal	Faculty
[51]	• Capacity building	Student Employee
[52]	• Social sites used as tool	Student
[53]	• Learning style • Age	Employee
[54]	• Infrastructure perspective	Student
[53]	• Learning style	Employees
[55]	• Compared the traditional learning with e-learning	Student
[56]	• E-learning predictors (educational technologies, development and use) • Satisfaction, problems and prospects	Faculty and Management
[30]	• E-learning predictors and use practices	Faculty and administrator
[57]	• Problems of e-learning	Academic staff and management

In [54], authors investigated the learning objectives and demographic factors on behavior, especially intention towards use, concluded that learning objectives have positive influence on behavior intention through perceived usefulness and perceived ease of use whereas the demographic factors have no influence on behavior Intention. Moreover, quantitative research concluded that e-learning plays a key role in capacity building and enriches the professional expertise in the specific field of interest [51]. A quantitative investigation found that normative belief, institutes and governments that support perceived usefulness influence behavior intention, whereas government support has no direct impact on behavior intention [49].

VIII. CONCLUSION

This study provided a systematic literature review and contributed valuable insights into the status of e-learning research regarding Pakistan. Administrative and organizational support, learner and faculty attitudes, cultural norms (language, religious belief and local culture), social influence, economic concerns and technical factors like organizational infrastructure, content customization, software support, accessibility of hardware and internet are the critical factors of e-learning adoption, acceptance and usage in the case of Pakistan. This study identified the presence of a significant gap in the quantitative research in the case of Pakistan. The authors emphasize that more research is required to gain the insights into e-learning adoption and critical success factors. The need is to highlight the region-specific external factors of technology acceptance that influence the usage of e-learning systems. The policy makers, HEIs, practitioners, and experts should consider the region-specific issues of e-learning acceptance, which eventually affects the continued use of the system.

REFERENCES

[1] J. L. Chen, "The effects of education compatibility and technological expectancy on e-learning acceptance", Comput. Educ., Vol. 57, No. 2, pp. 1501–1511, 2011

[2] Y. -H. Lee, Y. -C. Hsieh, C. -N. Hsu, "Adding Innovation Diffusion Theory to the Technology Acceptance Model: Supporting Employees' Intentions to use E-Learning Systems", Educ. Technol. Soc., Vol. 14, No. 4, pp. 124–137, 2011

[3] Y. -H. H. Lee, Y. -C. C. Hsieh, Y. -H. H. Chen, "An investigation of employees' use of e-learning systems: Applying the Technology Acceptance Model", Behav. Inf. Technol., Vol. 32, No. 2, pp. 173–189, 2013

[4] R. A. Sánchez, D. Hueros, "Motivational factors that influence the acceptance of Moodle using TAM", Comput. Human Behav., Vol. 26, No. 6, pp. 1632–1640, 2010

[5] S. S. Liaw, H. M. Huang, "Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments", Comput. Educ., Vol. 60, No. 1, pp. 14–24, 2013

[6] F. Kanwal, M. Rehman, "E-learning adoption model: A case study of Pakistan", Life Sci. J., Vol. 11, No. SPEC. ISSUE 4, pp. 78–86, 2014

[7] A. Al-adwan, J. Smedley, "Implementing e-learning in the Jordanian Higher Education System: Factors affecting impact", Int. J. Educ. Dev. using Inf. Commun. Technol., Vol. 8, No. 1, pp. 121–135, 2012

[8] R. G. Saade, F. Nebebe, and W. Tan, "Viability of the 'Technology Acceptance Model' in Multimedia Learning Environments: A Comparative Study", Interdiscip. J. Knowl. Learn. Objects, Vol. 3, pp. 175–184, 2007

[9] E. King, R. Boyatt, "Exploring factors that influence adoption of e-learning within higher education", Br. J. Educ. Technol., Vol. 46, No. 6, pp. 1272–1280 , 2015

[10] E. Sela, S. College, R. Gan, "Enterprise E-Learning Success Factors : An Analysis of Practitioners ' Perspective (with a Downturn Addendum)",

Interdisciplinary Journal of E-Learning & Learning Objects, Vol. 5, pp. 335-343, 2009

[11] M. F. Frimpon, "A Re-Structuring of the Critical Success Factors for E-Learning Deployment", American International Journal of Contemporary Research ,Vol. 2, No. 3, pp. 115–127, 2012

[12] S. Y. Park, "An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioural Intention to Use e-Learning", Educ. Technol. Soc., Vol. 1, No. 3, pp. 150–162, 2009

[13] S. C. Chang, F. C. Tung, "An empirical investigation of students' behavioural intentions to use the online learning course websites", Br. J. Educ. Technol., Vol. 39, No. 1, pp. 71–83, 2008

[14] A. Tarhini, K. Hone, X. Liu, "The effects of individual differences on e-learning users' behaviour in developing countries: A structural equation model", Comput. Human Behav., Vol. 41, pp. 153–163, 2014

[15] J. K. Leidecker and A. V. Bruno, "Identifying and using critical success factors", Long Range Plann., Vol. 17, No. 1, pp. 23–32, 1984

[16] M. E. Shank, A. C. Boynton, and R. W. Zmud, "Critical Success Factor Analysis as a Methodology for MIS Planning", MIS Q., Vol. 9, No. 2, p. 121, 1985

[17] T. Volery, D. Lord, "Critical success factors in online education", Int. J. Educ. Manag., Vol. 14, No. 5, pp. 216–223, 2000.

[18] B. Cheawjindakarn, P. Suwannatthachote, A. Theeraroungchaisri, "Critical Success Factors for Online Distance Learning in Higher Education: A Review of the Literature", Creat. Educ., Vol. 3, No. 8, pp. 61–66, 2012

[19] S. A. Odunaike, O. O. Olugbara, S. O. Ojo, "E-learning implementation Critical Success Factors", in Lecture Notes in Engineering and Computer Science, Vol. I, pp. 560–565, 2013

[20] O. F. Yew, M. Jambulingam, "Critical Success Factors of E-learning Implementation at Educational Institutions", Jounal Interdiscip. Res. Educ., Vol. 5, No. 1, pp. 17–24, 2015

[21] H. M. Selim, "Critical success factors for e-learning acceptance: Confirmatory factor models", Comput. Educ., Vol. 49, No. 2, pp. 396–413, 2007

[22] A. S. Khan, A. Nawaz, "Role of contextual factors in using e-Learning systems for higher education in developing countries", J. Educ. Res. Stud., Vol. 1, No. 4, pp. 27–34, 2013

[23] A. S. Al-Adwan, A. S. Al-Adwan, J. Smedley, "Exploring students acceptance of e-learning using technology acceptance model in jordanian universities", Int. J. Educ. Dev. Using Inf. Commun. Technol., Vol. 9, No. 2, pp. 4–18, 2013

[24] M. Z. Khan, A. K. Miankhel, A. Nawaz, "Information & Communication Technology and 'Individual':Prospects & Concerns", Global Journal of Computer Science and Technology Network, Web & Security, Vol. 13, No. 7, pp. 1-9, 2013

[25] S. Farid, R. Ahmad, I. A. Niaz, M. Arif, S. Shamshirband, M. D. Khattak, "Identification and prioritization of critical issues for the promotion of e-learning in Pakistan", Comput. Human Behav., Vol. 51, pp. 161–171, 2015

[26] W. Bhuasiri, O. Xaymoungkhoun, H. Zo, J. J. Rho, A. P. Ciganek, "Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty", Comput. Educ., Vol. 58, No. 2, pp. 843–855, 2012

[27] A. Nawaz, "Using e-learning as a tool for 'education for all' in developing states", Int. J. Sci. Technol. Educ. Res., Vol. 4, No. 3, pp. 38–46, 2013

[28] G. M. Kundi, A. Nawaz, "From e-Learning 1.0 to e-Learning 2.0: Threats & Opportunities for Higher Education Institutions in the Developing Countries", Eur. J. Sustain. Dev., Vol. 3, No. 1, pp. 145–160, 2014

[29] A. Nawaz, M. Z. Khan, "Issues of Technical Support for e-Learning Systems in Higher Education Institutions", Int. J. Mod. Educ. Comput. Sci., Vol. 2, pp. 38–44, 2012

[30] A. Nawaz, G. M. Kundi, "Predictor of e-learning development and use practices in higher education institutions", J. Sci. Technol. Educ. Res., Vol. 1, pp. 44–54, 2010

[31] K. Ameen, G. E. Gorman, "Information and digital literacy: a stumbling block to development?: A Pakistan perspective", Libr. Manag., Vol. 30, No. 1/2, pp. 99–112, 2009

[32] A. Sibghatullah, "Repositioning Virtual University of Pakistan", Developing Country Studies, Vol. 6, No. 5, pp. 98-108, 2016

[33] A. Perveen, "Critical Discourse Analysis of Moderated Discussion Board of Virtual University of Pakistan", Vol. 7, No. 3, pp. 243–262, 2015

[34] A. Nawaz, "Investigating the change management: For implementing e-learning projects in higher education", Glob. J. Manag. Soc. Sci. Res., Vol. 2, No. 1, pp. 14–24, 2014

[35] S. Basar, Rahatullah, N. Allah, A. Adnan, "Net Generations, Threats& Oppurtunities for Higher Education Institutes", Life Sci. J., Vol. 10, No. 12s, pp. 372–377, 2013

[36] S. Basar, Rahatullah, K. Asad, A. Adnan, "Paradigm Shift from eLearning-1 to eLearning-2", Life Sci. J., Vol. 10, No. 12s, pp. 564–571, 2013

[37] N. Hameed, M. Shaikh, F. Hameed, "Effect of Cultural Factors on Students of Pakistan", Int. J. Educ. Inf. Technol., Vol. 6, No. 4, pp. 310–318, 2012

[38] A. Nawaz, "E-Learning experiences of HEIs in advanced states , developing countries and Pakistan", Univers. J. Educ. Gen. Stud., Vol. 1, No. 3, pp. 72–83, 2012

[39] A. Nawaz, N. Khan, A. Miankheil, "Challenges of e-Teaching : Contemporary Paradigms and Barriers", Res. J. Inf. Technol., Vol. 3, No. 2, pp. 99–107, 2011

[40] A. Nawaz, Z. Awan, B. Ahmad, "Integrating educational technologies in higher ducation of the developing countries", J. Educ. Pract., Vol. 2, No. 2, pp. 1–13, 2011

[41] M. Ali, A. Ahmed, A. W. Shaikh, A. H. S. Bukhari, "Impacts of Information Technology on E-learning System in Pakistan", Sindh Univ. Res. J., Vol. 43, pp. 29–34, 2011

[42] A. Nawaz and G. M. Kundi, "Users of e-learning in higher education institutions (HEIs): perceptions , styles and attitudes", Int. J. Teach. Case Stud., Vol. 3, No. 2/3/4, pp. 161–174, 2011.

[43] M. J. Iqbal, M. Ahmad, "Enhancing Quality of Education through E-LEARNING : The Case Study of Allama Iqbal Open University", Turkish Online J. Distance Educ., Vol. 11, No. 1, pp. 84–97, 2010

[44] F. Shafique, K. Mahmood, "Indicators of the Emerging Information Society in Pakistan", Inf. Dev., Vol. 24, No. 1, pp. 66–78, 2008

[45] B. G. Jayatilleke, C. Gunawardena, "Cultural perceptions of online learning: transnational faculty perspectives", Asian Assoc. Open Univ. J., Vol. 11, No. 1, pp. 50–63, 2016

[46] F. Kanwal, M. Rehman, "Measuring Information , System and Service Qualities for the Evaluation of E-Learning Systems in Pakistan", Pak. J. Sci., Vol. 68, No. 3, pp. 302–307, 2016

[47] A. Perveen, "Synchronous and Asynchronous E-Language Learning : A Case Study of Virtual University of Pakistan", Open Prax., Vol. 8, No. 1, pp. 21–39, 2016

[48] H. J. Shah, S. Attiq, "Impact of Technology Quality, Perceived Ease of Use and Perceived Usefulness in the Formation of Consumer's Satisfaction in the Context of E-learning", Abasyn J. Soc. Sci., Vol. 9, No. 1, pp. 124–140, 2016

[49] M. S. Abbasi, A. Tarhini, T. Elyas, F. Shah, "Impact of individualism and collectivism over the individual's technology acceptance behaviour: A multi-group analysis between Pakistan and Turkey", J. Enterp. Inf. Manag., Vol. 28, No. 6, pp. 747–768, 2015

[50] S. Farid, R. Ahmad, M. Alam, "A Hierarchical Model for E-learning Implementation Challenges using AHP", Malaysian J. Comput. Sci., Vol. 28, No. 3, pp. 166–188, 2015

[51] M. Zaheer, S. Jabeen, M. M. Qadri, "Role of e-learning in capacity building : An Alumni View", Vol. 7, No. 1, pp. 71–81, 2015

[52] I. A. Qureshi, H. Raza, M. Whitty, "Facebook as e-learning tool for higher education institutes", Knowl. Manag. E-Learning, Vol. 6, No. 4, pp. 440–448, 2014

[53] S. A. M. Shah, N. Iqbal, S. Y. Janjua, S. Amjad, "Employee Behavior Towards Adoption of E-learning Courses: Validating Technology

Acceptance Model", Mediterr. J. Soc. Sci. MCSER Publ., Vol. 4, No. 14, pp. 765–774, 2013

[54] Ghias-udDin-Shah, M. N. Bhatti, M. Iftikhar, "Implementation of Technology Acceptance Model in E-Learning Environment in Rural and Urban areas of Pakistan", World Appl. Sci. J., Vol. 27, No. 11, pp. 1495–1507, 2013

[55] S. B. Khan, N. B. Jumani, "E-Learning versus Traditional Learning in Pakistan", Asian J. Distance Educ., Vol. 10, No. 1, pp. 28–34, 2012

[56] Q. A. Qureshi, A. Nawaz, N. Khan, "Prediction of the problems, user-satisfaction and prospects of e-learning in HEIs of KPK, Pakistan", Int. J. Sci. Technol. Educ. Res., Vol. 2, No. 2, pp. 13–21, 2011

[57] G. M. Kundi, A. Nawaz, S. Khan, "The Predictors Of Success For E-Learning In Higher Education Institutions (Heis) In N-W.F.P, Pakistan", J. Inf. Syst. Technol. Manag., Vol. 7, No. 3, pp. 545–578, 2010

[58] I. Qureshi, K. Ilyas, R. Yasmin, M. Whitty, "Challenges of implementing e-learning in a Pakistani university", Knowl. Manag. E-Learning, Vol. 4, No. 3, pp. 310–324, 2012

[59] D. A. Niwaz, D. M. S. Khan, D. T. M. Khan, "Evaluation of job placement and satisfaction of graduate students of Virtual University Pakistan", Int. J. Learn. Dev., Vol. 3, No. 6, pp. 37-46, 2013