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Full Length Research Paper

Quantifiable characteristics of opportunities and prospects of eLearning in Higher Education Institutions in Pakistan

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Both opportunities and prospects are sometimes used interchangeably, however, in this paper, opportunity refers to the 'availability of eLearning resources and service' while prospects denote 'futuristic expectations about the role of Information and Communication Technologies (ICTs) in Higher Education Institutions (HEIs)'. The empirical findings suggest that people score lower on opportunities but score significantly higher on the prospects showing that they are not quite happy with the facilities and services available (due to the development, implementation and use problems – or simply management problems of eLearning). But they can clearly foresee the significant role of ICTs or Education Technologies (ETs) in future in the context of developing countries like Pakistan. Furthermore, these differences are attributed to the demographic diversities of the respondents, meaning that the demographic variation changes the power and direction of the user-attitudes towards e-Learning. This paper uses stepwise regression to gradually glean-out the most significant predictors of opportunities and prospects from a group of eight demographics.

Key words: ICTs, ETS, HEIs, VLE, eLearning, eTeaching, ePedagogy, eCourses, opportunities, prospects, demographic-attributes.

INTRODUCTION

Opportunities are the user-perceived benefits in Information and Communication Technologies (ICTs) while prospects refer to the perceived future of Education Technologies (ETs) or eLearning tools in higher education (Purnomoi and Leeii, 2010). The opportunities and particularly, prospects are very highly scored around the world. Teachers, students and administrators are very positive about the existing opportunities provided by the ICTs and the future of these technologies in higher education (Nawaz and Qureshi, 2010). Even when many problems are reported by the respondents with regard to the installation and use of eLearning systems, they score high on the opportunities and prospects showing that despite the problems, ICTs have the future. It also shows that users believe in the opportunities conceived in these technologies but there are problems in their management and use (Nawaz, 2011, 2012b).

The current trend in eLearning projects is collaborative development and use. The researchers have documented volumes of research suggesting that if eLearning systems are built more according to the contextual demands, there are greater chances of a successful initiative (Chan and Lee, 2007; Nawaz and Kundi, 2010b). Traditionally, „one-for-all" model prevailed, which failed in many situations thereby opening research about the contextual determinants of eLearning projects. Research over research is confirming that compatibility of new gadgets with user-demographics and environmental dimensions are the only criteria for future eProjects of eLearning in higher education institutions (HEIs) (Nawaz et al., 2011b; Nawaz, 2012d).

This gap is indicative of the problems and obstacles which are holding back the university constituents to fully integrate ICTs in their teaching, learning and administrative

administrative functions (Nawaz et al., 2007; Qureshi et al., 2009). These barriers come from the user-demographics and the factors concerning eLearning-environments in HEIs, such as, ETS, Development and Use Practices, User Training and Satisfaction, etc., meaning that the gap is between the „user and environmental-requirements‟ and „whatever is available to the users in practice, that is, the contextual mismatch‟ (Nawaz and Kundi, 2010a; Nawaz, 2011).

LITERATURE REVIEW

ICTs are providing several opportunities to all the countries of the world thereby creating the brighter prospects of eLearning particularly for the developing states in handling their long-standing problems of mass education (Sofowora, 2009). ICTs are capable of increasing the opportunities of active learning, inter-connectivity, enhanced feedback and a working environment of teamwork and collaboration (El-Hussein and Cronje, 2010). Views of the eLearning-users are founded on their „digital-literacy‟ which builds their attitudes towards ICTs, ETS and eLearning in higher education (Kundi and Nawaz, 2010) as well their demographic attributes (Nawaz and Kundi, 2010b).

Opportunities of eLearning

A repeated claim of the technology-proponents is that ICTs conceive unprecedented opportunities, particularly, for the „developing-countries‟. This optimism is founded on the premise that the miraculous capabilities of the digital-gadgets have transformed the society into a „global-village‟ through a kind of connectivity, which is never quoted in the history of mankind (Nawaz et al., 2007). The use of ICTs in and for education is rapidly expanding in many countries and considered both as a necessity and an opportunity. Research also suggests that ICTs offer new learning opportunities for students (eLearning), develop teacher‟s professional capabilities (ePedagogy) and strengthen institutional capacity (eEducation) (Ezziane, 2007), and most universities today offer some form of eLearning (Komba, 2009; Nawaz, 2011).

Virtual learning environments (VLEs) have emerged with tools and techniques for the course-management and interactivity of teachers and learners through a long line of opportunities particularly, the web-based applications, which enable them not to simply deliver knowledge rather empower learners to develop research skills and capitalize on web to “harvest knowledge” (Gray et al., 2003; Wijekumar, 2005; Manochehr, 2007). Similarly, Internet offers opportunities which need to be explored by the technologies that are designed well and used as intended, thus, eLearning offers exciting opportunities for both teachers and students (Nawaz, 2012).

One of the big expectations tied to eLearning speaks about its ability to introduce equal education to everyone because of the possibility that eCourses will reach any corner of our planet and thus deliver the same high-quality education everywhere. The biggest optimists have a vision of top-ranking universities acting over the Internet using ready-made courses for huge amounts of students in Third-World countries (Hvorecký, 2005). Because eLearning is supported by internet and web technologies, it offers opportunities for social learning approaches (Luck and Norton, 2005). For example, a new feature of eLearning „Blogs‟ provide the opportunity for feedback from anyone in the world creating limitless collaborative options. In sum, they are potentially powerful collaborative tools to build writing ability (El-Hussein and Cronje, 2010).

New technologies reduce transaction costs for reproduction and distribution to a minimum. In principle, ICTs offer the opportunity to merge two formerly distinct processes, publishing and archiving, into one integrated activity. To put a document in an online repository is simultaneously a step to publish it (Pfeffer, 2004). As we enter the third millennium, education via the internet, intranet or network represents great and exciting opportunities for both educators and learners (Manochehr, 2007; Halse and Mallinson, 2009). While instructors cannot always accommodate each student‟s need, it is important that several learning opportunities are provided (Nawaz, 2011, 2012a).

Prospects of eLearning

Universities are challenged to integrate ICTs into their strategies, their institutions and educational processes. Policy responses are better if devised at national and supranational levels, the major aims being the improvement of quality and flexibility, the widening access to the field of tuition, the possibility of reaching populations as yet un-reached by higher education (Loing, 2005). Such missions are those of the “Mega-Universities”, those large distance education institutions which are already broadening the scope of higher education in several countries (Nawaz and Kundi, 2010c). When ICTs are adapted to local technological conditions, they become a major tool both for on-campus students, and for reaching the new target groups engaged in lifelong learning processes or on professional markets (Nawaz et al., 2011a).

Researchers predict the prospects of „multi-varsities‟ focusing on the provision of a large diversity of programs, and „flexi-varsities‟ featuring market specialization and staff and student flexibility. This change in the universities represents a move “from being scholarly ivory towers to information corporations (UQA, 2001).” Thus, ICTs have prospects for universities in developing countries to improve their teaching and learning processes. It is argued that, universities in developing countries should

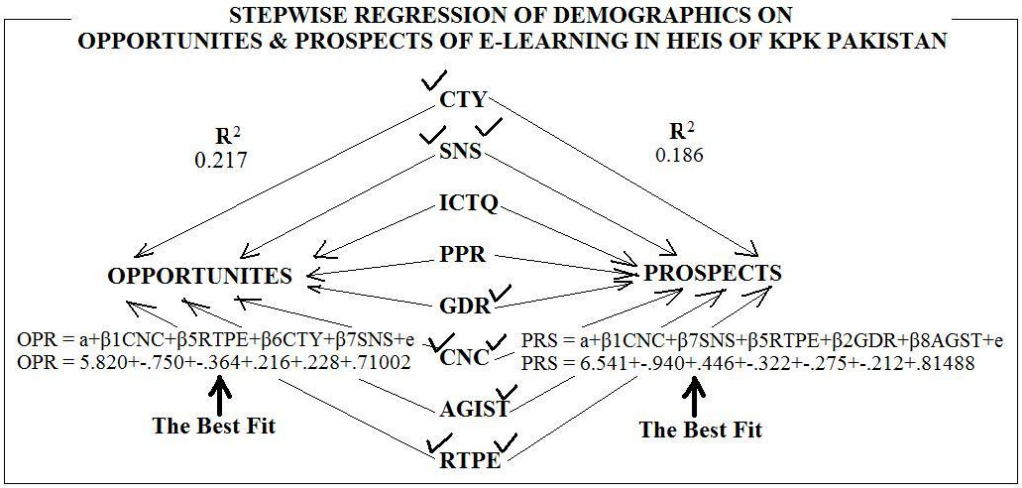

Figure 1. Schematic diagram of the theoretical framework.

adopt eLearning technologies to improve teaching and learning processes (Sife et al., 2007). But pedagogical, technical and cost issues should be taken into account for each specific technology when integrating ICTs in teaching and learning practices (Nawaz et al., 2011d).

ICT-based education is seen as the dominant engine for productivity improvement and business opportunities and a key factor for generating future employment. For instance, virtual or distance learning can help to overcome the problems associated with geographical isolation and is invaluable for students in remote areas (Thompson, 2007). Distance learning educational software also benefits from economies of scale increasing cost efficiencies. Recruiting teachers for the more remote regions is often difficult in developing countries; ICT serves to counteract physical distance as teachers can maintain contact with family and friends through telephone and e-mail (Wims and Lawler, 2007; Qureshi et al., 2009). However, to increase the prospects of eLearning to improve higher education requires reshaping of the mindset and practices in the teaching, learning and educational administration (Nawaz, 2011, 2012c).

Demographic implications

Research shows that despite the claimed advantages of eLearning, problems can arise if new systems are not compatible with the learner characteristics like nationality and gender (Nawaz et al., 2007). Although, with regard to an individual user, two key factors are users‟ motivation towards eLearning and their capabilities in using eLearning facilities; however, the users‟ attitude towards ETS depends on their personal characteristics including age, gender, teacher-centric versus student-focused teaching and learning, digital literacy, and learning styles (Nawaz, 2011). Other researchers support this idea by noting that teachers‟ use of ICTs is influenced by the factors like: demographic-attributes (age, educational background, etc), access to hardware, experience in using computers, and perceptions about the usefulness and ease of using new digital gadgets (Nawaz et al., 2011b).

The demographic impacts on user perceptions, theories, and attitudes on the development and use of eLearning in HEIs are well documented (Wims and Lawler, 2007). The developers of eLearning systems are repeatedly advised to address demographic differences through devising such strategies, which generate and sustain positive attitudes of users in eLearning environments (Moolman and Blignaut, 2008). These differences emanate from the user-characteristics of gender, age, educational level, computer skills, previous experience with eLearning, learning styles, personal goals and attitudes, preferences, cultural background and motivation (Nawaz and Kundi, 2010b; Nawaz, 2012d).

Figure 1 portrays a graph of the theoretical model showing the structure and distribution of the hypothesis tested for this publication and empirical outputs computed through stepwise regression analysis. Both R^2 and the best-fit models are also shown in the figure.

RESEARCH DESIGN

Survey approach has been used in this project by selecting a sample from the population of teachers, students and administrators in the higher education of KPK. The population of this study includes all the HEIs in the province while the sample included all the institutions in two cities of Peshawar and DIK (big and small cities respectively), selected due to the following features:

a. Peshawar (big city) and Dera Ismail Khan (DIK) (small city).

b. Both cities host two of the oldest universities of the province (University of Peshawar - 1950 and Gomal University - 1974).

c. The cities have both the oldest as well as new universities (pre-2000 and the post-2000) working in public and private sectors.

d. These institutions are populated with students, teachers and administrators from almost all cities and areas of the province.

A structured questionnaire was developed from the existing literature by extracting both research and demographic variables. Besides demographics, the variables were about the perceptions of users as regards educational technologies, their available opportunities and expectations of the students, teachers and administrators about the future prospects of eLearning in HEIs (30 items on a 7-point scale). The questions relating to the available opportunities and future prospects were 9 and 7 respectively. The Cronbach‟s alpha was estimated at 0.9288, with 354 cases and 38 survey items (with eight demographics). This value is acceptable as it exceeds the required minimum score of 0.7 for overall reliability (Koo, 2008).

In this study, SPSS 12.0 was used to create the database for applying statistical procedures to produce descriptive tables and test the hypotheses for inferential analysis. For testing of the hypotheses, stepwise multiple regression procedures were used to gradually eliminate the weak predictors from the „best-fit‟ for the prediction of opportunities and prospects. Two research-variables (Current Opportunities and Future Prospects of eLearning) were selected for computing the impacts of eight demographics on the respondents‟ attitudes. All the demographic-attributes were converted into „Dummy-variables‟ with 0 and 1 as codes for all the variables.

FINDINGS OF THE STUDY

Demographic groups

Table 1 shows the frequencies of the demographic groupings of this study‟s sample.

Regression of demographics on opportunities of eLearning

Models, coefficients and excluded variables (OPR)

Here, the study shows the details of the four models (Table 2), the coefficients of regression in the four models (Table 3), and the excluded variables in the four models (Table 4).

Analysis I

Regression models in Table 2 give the detail of all four procedures applied to find the best fit equation to predict the opportunities of eLearning as expressed by the respondents with differing demographic features. As given in the table, the first model explains 14% of the variation in opportunities; however as the new models are developed, the percentage goes up, and ultimately, the fourth model predicts 22% of the dependent variable. Similarly, Table 4 gives a list of excluded variables with p-values greater than the required 0.05 to test the hypotheses.

The best fit equation is:

$$OPR = a+\beta_{1CNC}+\beta_{5RTPE}+\beta_{6CTY}+\beta_{7SNS}+e$$

OPR = 5.820+-.750+-.364+.216+.228+.71002

Regression of demographics on prospects of eLearning

Models, coefficients and excluded variables (PRS)

Here, the study shows coefficients of regression in five models (Table 5), a second set of coefficients of regression in five models (Table 6), and excluded variables from five models (Table 7).

Analysis II

The first model (Table 5) explains 11% of the variation in the dependent variable, however, this prediction power increases gradually with the succeeding models of regression and finally reaching the level of 19% prediction of the prospects. The fifth model includes five factors as the best fit variables explaining maximum of variation in the dependent variable. The excluded variables (Table 7) appear with p-values (0.075, 0.843, and 0.652) which are far greater than the required threshold of 0.05.

The best fit is:

$$PRS = a+\beta_{1CNC}+\beta_{7SNS}+\beta_{5RTPE}+\beta_{2GDR}+\beta_{8AGST}+e$$

PRS = 6.541+-.940+.446+-.322+-.275+-.212+.81488

FINAL ANALYSIS

Table 8 shows the summary of Best-Fit models and the excluded variables, while Table 9 shows analysis of the role played by demographics.

In Table 9, the following findings emerge:

1. CNC, SNS and RTPE are the most significant factors which are playing roles in both the opportunities and prospects.

2. The respondents with „formal and informal‟ ICT qualification and those from public and private HEIs view both opportunities and prospects in a similar manner.

Table 1. Frequencies of the demographic groupings (n=354).

S/N	Demographic variable	Frequency	Percent	Valid percent
	City - CTY			
1	Small City (D. I. Khan)	145	41.0	41.0
	Big City (Peshawar)	209	59.0	59.0
	Science/Non-Science - SNS			
2	Science Respondents	152	42.9	42.9
	Non-Science Respondents	202	57.1	57.1
	ICT Qualification - ICTQ			
3	Formal Computer Qualification	119	33.6	33.6
	Informal Computer Qualification	235	66.4	66.4
	Public/Private - PPR			
4	Public Universities	180	50.8	50.8
	Private Universities	174	49.2	49.2
	Gender - GDR			
5	Male Respondents	241	68.1	68.1
	Female Respondents	113	31.9	31.9
	Computer/Non-Computer - CNC			
6	Computer (as a Subject)	101	28.5	28.5
	Non-Computer (other Subjects)	253	71.5	71.5
	Age of the Institute - AGIST			
7	Pre2000 (established before 2000)	191	54.0	54.0
	Post2000 (established after 2000)	163	46.0	46.0
	Respondent-Type - RTPE			
8	Student Respondents	132	37.3	37.3
	Teachers and Administrators	222	62.7	62.7

Table 2. Details of the four models.

Model	R	R Square	Adjusted R Square	Std. error of the estimate	F	Sig.
1	0.376(a)	0.141	0.139	0.74047	57.803	0.000(a)
2	0.430(b)	0.185	0.180	0.72242	39.768	0.000(b)
3	0.452(c)	0.205	0.198	0.71461	29.999	0.000(c)
4	0.466(d)	0.217	0.208	0.71002	24.177	0.000(d)

Detail of the models:
a. Predictors: (Constant) CNC
b. Predictors: (Constant) CNC, RTPE
c. Predictors: (Constant) CNC, RTPE, CTY
d. Predictors: (Constant) CNC, RTPE, CTY, SNS
e. Dependent variable: OPPORTUNITES

3. Similar opportunities are expressed by both the males and females but they are different about the prospects of eLearning.

4. There are different opportunities in big and small cities showing the difference of resources available in both cities.

Table 3. Coefficients of regression in four models.

Model	Variable	Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.787	0.074		78.544	0.000
	CNC	-0.663	0.087	-0.376	-7.603	0.000
2	(Constant)	5.982	0.085		70.555	0.000
	CNC	-0.632	0.085	-0.358	-7.411	0.000
	RTPE	-0.346	0.080	-0.210	-4.337	0.000
3	(Constant)	5.826	0.099		58.779	0.000
	CNC	-0.595	0.085	-0.337	-6.972	0.000
	RTPE	-0.357	0.079	-0.216	-4.519	0.000
	CTY	0.231	0.078	0.142	2.952	0.003
4	(Constant)	5.820	0.099		59.081	0.000
	CNC	-0.750	0.107	-0.425	-6.982	0.000
	RTPE	-0.364	0.078	-0.221	-4.644	0.000
	CTY	0.216	0.078	0.134	2.777	0.006
	SNS	0.228	0.097	0.142	2.354	0.019

Dependent variable: Opportunities of eLearning in HEIs of KPK, Pakistan.

Table 4. Excluded variables in the four models.

Model	Variable	Beta In	t	Sig.	Partial Correlation	Collinearity statistics Tolerance
4	ICTQ	0.028(d)	0.327	0.744	0.018	0.307
	PPR	-0.077(d)	-1.527	0.128	-0.082	0.881
	GDR	-0.033(d)	-0.660	0.510	-0.035	0.926
	AGIST	-0.015(d)	-0.320	0.749	-0.017	0.965

Table 5. Coefficients of regression in the five models.

Model	R	R Square	Adjusted R Square	Std. error of the estimate	F	Sig.
1	0.329(a)	0.109	0.106	0.84816	42.860	0.000(a)
2	0.369(b)	0.136	0.131	0.83603	27.702	0.000(b)
3	0.394(c)	0.155	0.148	0.82810	21.408	0.000(c)
4	0.416(d)	0.173	0.164	0.82043	18.252	0.000(d)
5	0.432(e)	0.186	0.175	0.81488	15.955	0.000(e)

Detail of the models:
a. Predictors in the Model: (Constant) CNC
b. Predictors in the Model: (Constant) CNC, SNS
c. Predictors in the Model: (Constant) CNC, SNS, RTPE
d. Predictors in the Model: (Constant) CNC, SNS, RTPE, GDR
e. Predictors in the Model: (Constant) CNC, SNS, RTPE, GDR, AGIST
f. Dependent variable: PRC_PRS

5. Likewise, respondents from older institutes expect different prospects than those from new institutions.

Conclusions

Despite the researchers‟ conviction that eLearning has the potential to create current opportunities and thereby future prospects, it is not difficult to express several counterarguments against such overoptimistic conclusions (Hvorecký, 2005; Nawaz et al., 2007). More specifically, eLearning is either a threat or opportunity for the HEIs of the world in general and developing countries

Table 6. Coefficients of regression in five models.

Model	Variable	Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
1	(Constant)	6.203	0.084		73.499	0.000
	CNC	-0.654	0.100	-0.329	-6.547	0.000
2	(Constant)	6.169	0.084		73.611	0.000
	CNC	-0.911	0.125	-0.459	-7.304	0.000
	SNS	0.382	0.114	0.211	3.360	0.001
3	(Constant)	6.311	0.097		64.735	0.000
	CNC	-0.899	0.124	-0.453	-7.267	0.000
	SNS	0.397	0.113	0.219	3.516	0.000
	RTPE	-0.255	0.091	-0.137	-2.785	0.006
4	(Constant)	6.421	0.105		61.430	0.000
	CNC	-0.888	0.123	-0.448	-7.249	0.000
	SNS	0.414	0.112	0.229	3.695	0.000
	RTPE	-0.321	0.094	-0.173	-3.424	0.001
	GDR	-0.267	0.097	-0.139	-2.752	0.006
5	(Constant)	6.541	0.115		56.780	0.000
	CNC	-0.940	0.124	-0.474	-7.606	0.000
	SNS	0.446	0.112	0.246	3.981	0.000
	RTPE	-0.322	0.093	-0.174	-3.462	0.001
	GDR	-0.275	0.096	-0.143	-2.854	0.005
	AGIST	-0.212	0.088	-0.118	-2.402	0.017

Dependent variable: Prospects of eLearning in HEIs of KPK.

Table 7. Excluded variables from the five models.

Model	Variable	Beta In	t	Sig.	Partial correlation	Collinearity statistics
						Tolerance
5	CTY	0.088(e)	1.787	0.075	0.095	0.963
	ICTQ	-0.017(e)	-0.198	0.843	-0.011	0.310
	PPR	0.038(e)	0.451	0.652	0.024	0.333

Table 8. Summary of Best-Fit models and the excluded variables.

Model	Variable	
Opportunities of eLearning		
1	Hypothesized Model	$OPR = a+\beta_{1CNC}+\beta_{2GDR}+\beta_{3ICTQ}+\beta_{4PPR}+\beta_{5RTPE}+\beta_{6CTY}+\beta_{7SNS}+\beta_{8AGST}+e$
2	Best Fit	$OPR = a+\beta_{1CNC}+\beta_{5RTPE}+\beta_{6CTY}+\beta_{7SNS}+e$ OPR = 5.820+-.750+-.364+.216+.228+.71002
3	Excluded Variables	ICTQ, PPR, GDR and AGIST
Prospects of eLearning		
1	Hypothesized Model	$PRS = a+\beta_{1CNC}+\beta_{2GDR}+\beta_{3ICTQ}+\beta_{4PPR}+\beta_{5RTPE}+\beta_{6CTY}+\beta_{7SNS}+\beta_{8AGST}+e$
2	Best Fit	$PRS = a+\beta_{1CNC}+\beta_{7SNS}+\beta_{5RTPE}+\beta_{2GDR}+\beta_{8AGST}+e$ PRS = 6.541+-.940+.446+-.322+-.275+-.212+.81488
3	Excluded Variables	CTY, ICTQ and PPR

Table 9. Analysis of the role played by demographics.

S/N	Factors	Reg-1 (OPR)	Reg-2 (PRS)	Role
1	CNC	√	√	2
2	SNS	√	√	2
3	ICTQ	-	-	0
4	RTPE	√	√	2
5	GDR	-	√	1
6	PPR	-	-	0
7	CTY	√	-	1
8	AGIST	-	√	1

in particular. But the benefits are determined by the ability of developers and users to tame the technologies and change their context simultaneously as to create a customized and localized match between the requirements of eLearning and objectives of a particular institute, community, or state (Nawaz, 2011). This requires research on the nature of technologies, native context and the relationships between the two at the moment and in the future (Nawaz et al., 2011d; Nawaz, 2012d).

The management of the university and eLearning-developers must understand the native context which contains powerful demographic diversities, which if not identified, can be counterproductive in implementing the digital systems in higher education (Nawaz et al., 2011b, 2011c). As Table 9 shows, the divides between computer/non-computer, science and non-science and respondent type (teachers, students and administrators) are alarmingly different from each other. All the three factors are playing parallel role in determining both the opportunities and prospects of eLearning. These differences in users‟ opinion must be addressed because they can either make or break the present and future of eLearning in HEIs of KPK, Pakistan (Qureshi et al., 2011; Nawaz, 2011).

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