INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

HRMARS MANAGEMENT ACADEMIC RESEARCH SOCIETY
EXPLORING INTELLECTUAL CAPITAL
www.hrmars.com
ISSN: 2226-6348

The Impact of E-Learning on Academic Performance: Preliminary Examination of King Khalid University

Udjo Eseroghene Franklin, Amal Ahmad Nahari

To Link this Article: http://dx.doi.org/10.6007/IJARPED/v7-i1/3903 DOI: 10.6007/IJARPED/v7-i1/3903

Received: *01 Feb 2018,* ***Revised:*** *02 Mar 2018,* ***Accepted:*** *19 Mar 2018*

Published Online: 22 Mar 2018

In-Text Citation: (Franklin & Nahari, 2018)

To Cite this Article: Franklin, U. E., & Nahari, A. A. (2018). The Impact of E-Learning on Academic Performance: Preliminary Examination of King Khalid University. *International Journal of Academic Research in Progressive Education and Development*, *7*(1), 83–96.

INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN PROGRESSIVE EDUCATION & DEVELOPMENT

HRMARS MANAGEMENT ACADEMIC RESEARCH SOCIETY
EXPLORING INTELLECTUAL CAPITAL
www.hrmars.com
ISSN: 2226-6348

The Impact of E-Learning on Academic Performance: Preliminary Examination of King Khalid University

Udjo Eseroghene Franklin
Department of Business Administration, Ibn Rushd College of Management Sciences, Abha- Saudi Arabia
Email: ese.udjo@ibnrushd.edu.sa

Amal Ahmad Nahari
Department of Business Administration, King Khalid University, Abha- Saudi Arabia
Email: a.analhari2@hotmail.com

Abstract
The study assessed the impact of electronic learning on academic performance in Saudi Arabia. Precisely, we evaluated the influence of web-based learning on academic staff at the King Khalid University utilizing a sample of 163 respondents as our unit of analyses. Structural equation modeling (SEM) was employed to evaluate the impact of the exogenous variables on the endogenous variables. Furthermore, SEM was used to test the hypothesized model. The results indicate that our hypothesized model reasonably fitted the data collected and five of the nine hypotheses were refuted. The study confirmed that acceptance for online teaching (AFOT), Technical competency (TC) and synchronous (SYNC) lectures have indirect influence on performance of academic staff (PERF_ACAD_STAFF). Additionally, acceptance for online teaching (AFOT) and Technical competency (TC) have direct impact on performance of academic staff (PERF_ACAD_STAFF).
We concluded that our empirical model presented in figure 3 should guide KKU in designing its E-learning initiatives. This is so because it will enable KKU students to achieve similar learning outcomes that are comparable to traditional classroom format.
Keywords: *E-learning, Online teaching, E –learners, web technologies, Performance, Academic Staff*

Introduction

E-Learning is known as Web-based learning, online learning, distributed learning, computer-assisted instruction or Internet-based learning. It is primarily a web-based system of education that makes information or knowledge available to users or learners. On the whole, E-learning disregards geographic proximity.

The application of web-based technologies for educational purposes has increased principally because the costs of adopting such technologies have dramatically decreased. Given this fact, universities are taking advantage of web- based learning and they are utilizing it to complement the face-to-face or traditional approach to learning. King Khalid University (KKU) has adopted the E-learning approach to complement its traditional face-to-face method of teaching and learning. In order to improve academic quality, effectiveness and efficiency of E-learning at KKU, the university relies on the blackboard learning system which it structured into three levels to suit different types of learning needs. The three structural levels are: the supportive, blended and full E-learning. Although KKU has recognized the importance of the role of E-learning as an integral part of its educational process, there are challenges that are impinging on its success. Such challenges have the potential of negatively impacting on the performance of instructors in delivering educational material. It is against this backdrop that the study seeks to examine the impact of E-learning on the performance of academic staff of KKU.

Overview of E-learning

Tavangarian et al., (2004) observed that E-learning is the adoption of electronic media to facilitate teaching and learning. It utilizes technology to deliver information embedded in educational material to learners situated in diverse geographical areas. E-learning is a substitute method for teaching and learning. It veers away from the conventional classroom lectures (Herrington et al., 2010). Alavi & Leidner (2001) conceptualized E-learning as a virtual learning environment where different forms of information technologies are used to mediate between the learner and the instructor. E-learning attempts to shift the focus of educational environment away from the physical teacher-student environment while disseminating information. Without regards to distance, instructors utilize new and improved web -based technologies to plan and structure teaching materials (Clark & Mayer, 2008). According to these authors, e-Learners are subjected to more critical challenges when compared to conventional learners. This is so because the efforts which should have been put in by instructors in motivating and instilling discipline in learners are transferred to the e-learner in an e- learning setting. Stated succinctly, the responsibility of inspiring and encouraging discipline is transferred from the conventional lecture-bearing instructor to the learner himself (Liaw, 2008). E- Students are themselves managers and students. They actively manage their learning process while the instructor sets the guidelines (Downes, 2005). E- Students see this as a barrier and it frustrates their learning efforts. The frustration either leads to high drop-out rate or reduced learner satisfaction (Liu et al., 2006).

The Impact of E-learning on Academic Performance

The impact of E-learning is assessed by ascertaining if students were able to grasp what was delivered or taught to them. Rosenberg et al., (2006) noted that E-learning reduces the ability of students to grasp what is taught or delivered. These authors stressed that there are marked differences between traditional face-to-face learning and E-learning. In a similar vein, Johnson (2005) observed that online teaching strategies have negative impact on academic performance.

On the contrary, Cavanaugh (2001) in a quantitative synthesis of studies of the effectiveness of interactive distance education using video conferencing and telecommunications for K-12 academic achievement emphasized that E-learning and the traditional face-to face approach are comparable. Arguments in favour of E-learning over the traditional or face- to- face learning are those of Barker & Wendel (2001), Hardaker et al.,(2000), Breuleux et at., (2002),Chambers (2003). The core arguments of these authors are that E-learning have positive impact on students' performance and that it increases the enrollment in academic program. Further to this, Kearsley (2000*)* opined that online learners achieve the same level of performance and satisfaction which is equal to that of face-to-face setting provided that the quality of instructional materials is similar.

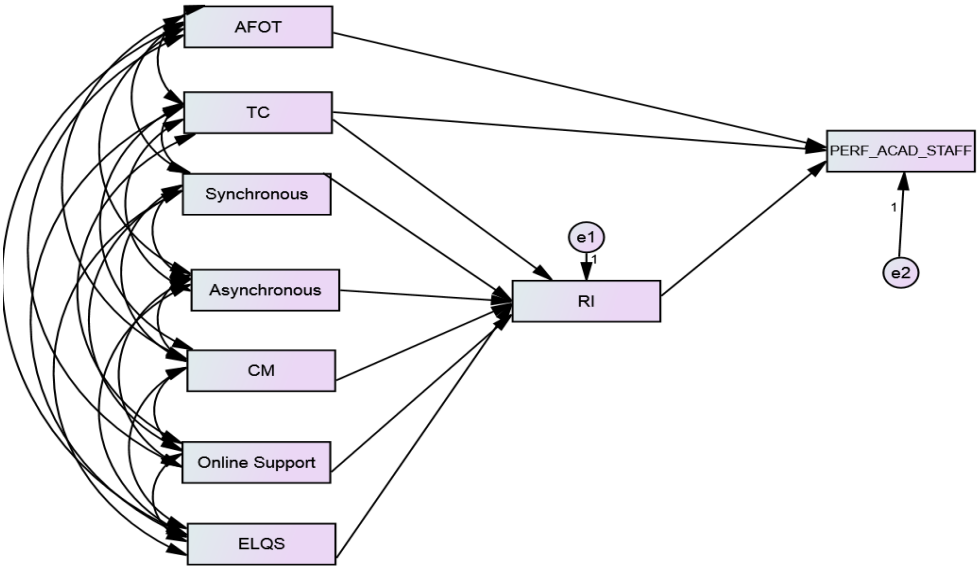
Barriers to E-learning Adoption and Implementation

Although e-learning is a phenomenal concept, its adoption is not without limitations. The utilization of state-of –the-art technologies does not guarantee that e-learning will result in expected benefits (Ettinger, Holton and Blass, 2006). These authors opined that E-learning is a hindrance rather than a facilitative procedure and substantiated their argument by noting that E-learning does not motivate learners when traditional models of learning are replicated simply by uploading traditional classroom learning materials on web-based platforms. The challenges posed by E-learning have motivated the development of varied pedagogical systems (Roy, 2006). In order to achieve this, various types of collaborators ranging from professional web-based designing firms, content writers and design formulators have begun to act together to create web-based E-learning programs designed to enhance learning through the recognition of various different types of student needs (Roy, 2006). Given that the positive and negative arguments on the impact of E-learning shows inconsistency, we proposed an E-learning model and on the basis of the model series of hypotheses were formulated and tested with a view to taking a standpoint on the subject of discourse.

Proposed Model and Hypotheses

The proposed E-learning model consists of seven exogenous and two endogenous variables. The exogenous variables are: Acceptance for online learning, Technical competency, Synchronous, Asynchronous, Collaborative methods, online support and E-learning quality standards. The endogenous variables include Reliable infrastructure and Performance of academic staff. Reliable infrastructure mediated between performance of academic staff and the five of the exogenous variables. See figure 1 for the proposed model.

Figure 1: The Proposed Model



On the basis of the proposed model, the following hypotheses were formulated:
H1: Acceptance for online teaching (AFOT) has significant impact on performance of academic staff
H2: Technical competency (TC) has significant impact on performance of academic staff
H3: Synchronous (SYNC) (real time lecture) has significant impact on reliable infrastructure (RI)
H4: Asynchronous (ASYNC) (recorded lecture) has significant impact on reliable infrastructure (RI)
H5: Collaborative methods (CM) has significant impact on reliable infrastructure (RI)
H6: Online support (OS) has significant impact on reliable infrastructure (RI)
H7: E-learning quality standards (ELQS) has significant impact on reliable infrastructure (RI)
H8: Reliable infrastructure (RI) has significant impact on performance of academic staff (PERF_ ACAD_STAFF)

Methodology

The population for this study is the academic staff at the King Khalid University (KKU). Although the population consists of a total of 4986 academic staff, its demographic spread consist of 2917 male faculty members and 2069 female members. Convenience sampling technique is used to select the 197 respondents that served as the sample size for the study. The initial sample size reduced to 163 respondents because 34 of the returned questionnaire were not found usable due to the reason that they were erroneously completed.

The questionnaire comprised of three parts namely: demographic component, E-learning and academic performance variables. The E-learning and academic performance variables consist of nine constructs that were used to develop the proposed model. The study measured the nine constructs on a 5-point Likert scale that ranged from strongly disagrees to strongly agree. The

nine constructs are: Acceptance for online teaching which we adapted as AFOT, Technical competency adapted as TC, Reliable infrastructures adapted as RI, Synchronous (real time lectures) adapted as SYNC, Asynchronous (recorded lectures) adapted as ASYNC, Collaboration methods adapted as CM, Online Support adapted as OS, E-learning quality standards adapted as ELQS and Performance of academic staff adapted as PERF_ACAD_StAFF. The first seven constructs are exogenous variables while the eighth and ninth are endogenous.

Data analysis underwent three stages. In the first stage, exploratory factor analysis (EFA) was used to assess the variability of the items. The second stage assessed reliability using Cronbach's alpha. A cut- off point of 0.7 was concluded to be a reliable coefficient. The third stage is the structural equation modeling using AMOS (version 22) and Maximum likelihood is chosen as a method of parameter estimation.

Results

Demographic analysis

Table 1a: Demographic variable

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	67	41.1	41.1	41.1
	female	96	58.9	58.9	100.0
	Total	163	100.0	100.0	

Table 1b: Demographic variables

Years of Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5	23	14.1	14.1	14.1
	5-9	45	27.6	27.6	41.7
	10-14	50	30.7	30.7	72.4
	>15	45	27.6	27.6	100.0
	Total	163	100.0	100.0	

JOB TITLE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Professor	7	4.3	4.3	4.3
	associate professor	25	15.3	15.3	19.6
	assistant professor	92	56.4	56.4	76.1
	Lecturer	38	23.3	23.3	99.4
	Others	1	.6	.6	100.0
	Total	163	100.0	100.0	

HIGHEST QUALIFICATION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	bachelor degree	6	3.7	3.7	3.7
	master degree	35	21.5	21.5	25.2
	PhD	116	71.2	71.2	96.3
	Others	3.7	3.7	3.7	100.0

Total	163	100.0	100.0	

The demographic characteristics of the respondents are presented in tables 1a and 1b. The key variables of interest are: gender, years of experience, job title and highest qualification. According to the table, 41.1% and 58.9% account for male and female respectively in the analysis regarding gender. For years of experience, 14.1% account for <5 years, 27% account for 5-9 years, 30.7 % account for 10-14 years and 27.6% account for > 15 years. The analysis on job title reveals that 4.3 % are professors, 15.8% are associate professor, 56.4% and 23.3% account for assistant professor and lecturer respectively. While 6% account for other job titles. Regarding highest education, 3.7% and 21.5% account for bachelor and master degree respectively. Doctoral degree (PhD) accounts for 71.2% while other academic qualification account for 3.7%.

Measurement Model Fit

The chi- Square test (X^2) is used to evaluate the goodness- of- fit of a model. This test statistic checks a null hypothesis to ascertain if a proposed or hypothesized model fitted the data collected (Fornell and Larcker, 1981). When X^2 is statistically significant (i.e $p < 0.05$), the conclusion is reached that the model does not adequately fit the data collected and such model is deemed unacceptable. The reverse is the case with X^2that is not statistically significant. On the basis of the X^2 indices presented in table 2, we are driven to contend that the proposed model adequately fit the data collected because the probability level associated with the X^2 is higher than the p- value. The indices of interest are :{ X^2 = (CMIN) =10.723; DF= 6; P> .05)}.

Table 2: Measurement Model Fit

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	39	10.723	6	.097	1.787
Saturated model	45	.000	0		
Independence model	9	907.524	36	.000	25.209

To ensure consistency of a researcher's judgment concerning model fit, absolute indices such as Goodness-of-Fit Index (GFI) and Root Mean Square Error of Approximation (RMSEA) are further examined. Additionally, incremental fit indices such as the Normed Fit Index (NFI) and Comparative Fit Index (CFI) were looked at to strengthen our judgment regarding the structural fit of the model. See table 3 to 5. With the exclusion of RMSEA, an incremental fit index> .90 indicates acceptable model fit (Hayduk, 1987). And a RMSEA index of .05 is seen as close fit and a value >.08 is perceived as reasonable fit (Browne and Cudeck, 1993; Byrne, 2001). The values in table 3, 4 and 5 are within the acceptable threshold levels. Specifically, GFI= .986; NFI= .988; CFI= .995; RMSEA= .070. These results further suggest that the proposed model is congruent with the data collected.

Table 3: Root Mean Square Residual and Goodness-of-Fit-Index

Model	RMR	GFI	AGFI	PGFI
Default model	.015	.986	.893	.131

Model	RMR	GFI	AGFI	PGFI
Saturated model	.000	1.000		
Independence model	.350	.291	.113	.232

Table 4: Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.988	.929	.995	.967	.995
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

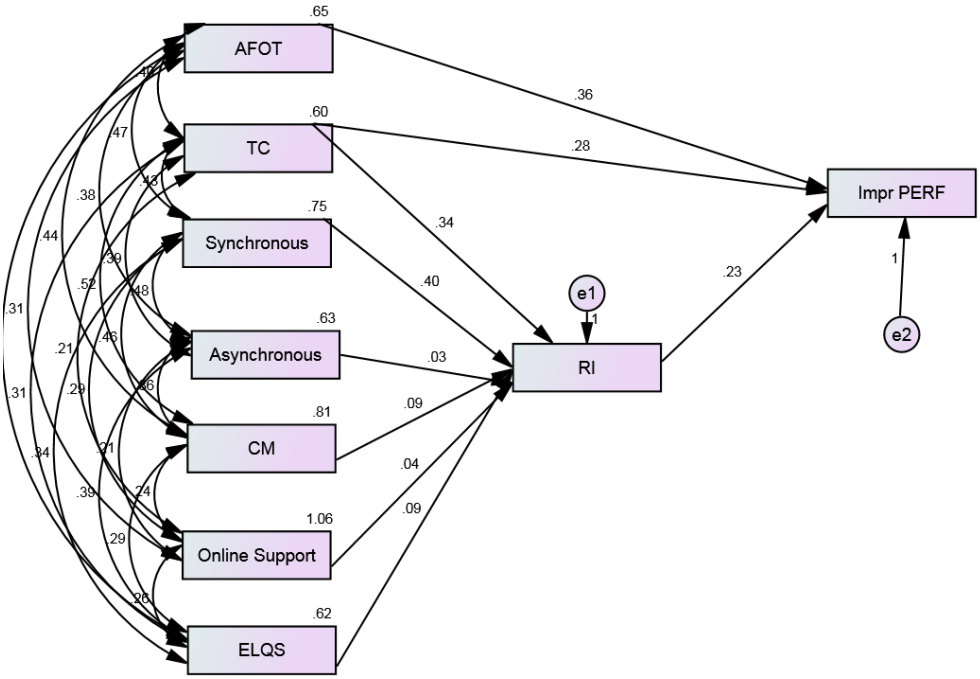
Table 5: Root Mean Square Error of Approximation

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.070	.000	.136	.265
Independence model	.387	.365	.409	.000

Structural Analysis

The proposed model was acceptable on the bases of X^2, GFI, NFI, CFI and RMSEA coefficients. The acceptance of the proposed model encouraged the researchers to embark on structural analyses of the model. Specifically, the researchers seek to ascertain the statistical significance of the coefficients which are associated with the paths in the model. See figure 2 for the proposed model and its estimated parameters.

Figure 2: The estimated parameters of the Proposed Model



The standardized regression weights and their corresponding p-values were used to assess the impacts of the exogenous variables on the endogenous variables and that of the mediating variable on the endogenous variable. See table 5 and 6. According to the tables, SYN and TC have positive significant impacts on RI. The standardized path coefficient and the associated p- value for SYN to RI is (SYN= .384, p< 0.000) and for TC to RI is (TC= .294, p<0.000). These results suggest that the two exogenous variables are good predictors of RI. Furthermore, RI has positive impact on PERF_ACAD_STAFF. The standardized path coefficient and its corresponding p-value is (RI= .247, p <0.001). This means that the mediating variable (RI) has significant impact on PERF_ACAD_STAFF. AFOT and TC have direct positive impacts on PERF_ACAD_STAFF. The standardized path coefficients are (AFOL= .352, p<.0.000; TC= .260, p< 0.000). These results showed that the two exogenous variables have direct significant positive impacts on PERF_ACAD_STAFF. Also, it is estimated that the predictors of RI explained 59 percent of its variance while the predictors of PERF_ACAD_STAFF explained 56 percent of its variance. See squared multiple correlation coefficients (R^2) in table 6.

Table 5: Regression weights

			Estimate	S.E.	C.R.	P	Label
RI	<---	SYN	.401	.081	4.923	***	par_1
RI	<---	OS	.040	.048	.830	.406	par_3
RI	<---	ASYN	.028	.092	.307	.759	par_4
RI	<---	CM	.092	.077	1.194	.233	par_5
RI	<---	ELQS	.092	.077	1.204	.229	par_6

			Estimate	S.E.	C.R.	P	Label
RI	<---	TC	.345	.100	3.444	***	par_30
PERF_ACAD_STAFF	<---	RI	.225	.070	3.219	.001	par_2
PERF_ACAD_STAFF	<---	AFOT	.359	.075	4.768	***	par_28
PERF_ACAD_STAFF	<---	TC	.278	.081	3.415	***	par_29

Table 6: Standardized Regression weights

			Estimate
RI	<---	SYN	.384
RI	<---	OS	.045
RI	<---	ASYN	.025
RI	<---	CM	.092
RI	<---	ELQS	.080
RI	<---	TC	.294
PERF_ACAD_STAFF	<---	RI	.247
PERF_ACAD_STAFF	<---	AFOT	.352
PERF_ACAD_STAFF	<---	TC	.260

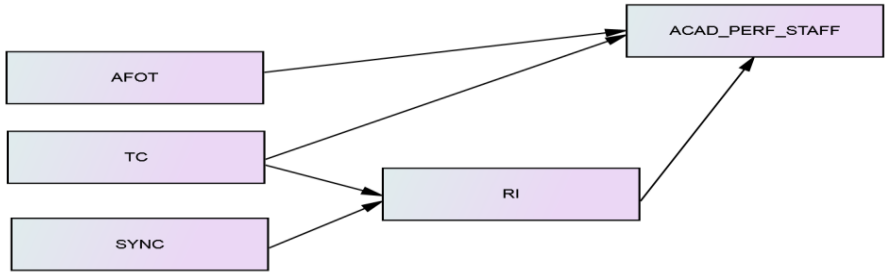
Table 6: squared multiple correlation coefficient (R^2)

	Estimate
RI	.590
PERF_ACAD_STAFF	.560

Implications, Recommendations and Conclusion

The objective of the study was to examine the impact of E-learning on the performance of academic staff of King Khalid University. The results facilitated the rejection of five hypotheses such as: H1, H2, H3, H4 and H9 However, the study confirmed that acceptance for online teaching (AFOT), Technical competency (TC) and synchronous (Sync) lectures have indirect influence on performance of academic staff (PERF_ACAD_STAFF). Furthermore, acceptance for online teaching (AFOT) and Technical competency (TC) have direct impact on performance of academic staff (PERF_ACAD_STAFF). The outcome of the hypotheses lead to the development of the empirical model (see figure 3) and we recommend that the model should guide the management of KKU in designing their E learning initiatives.

Figure 3: The Empirical Model



On the basis of the results, we recommend that the management of KKU should ensure that potential learners of the university accept to learn through web- based technology. In addition, the management of the university should certify that learners and instructors have the required technical competency. Furthermore, the teachings should occur in real time. These recommendations when perused can potentially increase the level of performance of academic staff in their course delivery activities.

We concluded that our empirical model should guide KKU in designing its E-learning initiatives in that it will enable students at KKU to achieve similar learning outcomes that are comparable to traditional classroom format.

References

Alavi, M., & Leidner, D. E. (2001). Technology-mediated learning- A call for greater depth and breadth of research. Information Systems Research, 12 (1), 1–10.

Barker, K., & Wendel, T. (2001). *E-Learning: Studying Canada's virtual secondary schools*. Kelowna, BC: Society for the Advancement of Excellence in Education. Retrieved December 27, 2016, from http://www.saee.ca/pdfs/006.pdf

Breuleux, A., Laferrière, T., & Lamon, M. (2002). Capacity building within and across countries into the effective uses of ICTs. Paper presented at the 2002 Pan-Canadian Education Research Agenda Symposium, Montreal, QC. Retrieved March 27, 2017 from http://www.cesc.ca/pcera2002E.html

Browne, M.W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In Bollen, K.A. & Long, J.S. [Eds.] *Testing structural equation models*. Newbury Park, CA: Sage, 136–162.

Byrne, B. M. (1994). Structural equation modeling with EQS and EQS/Windows. Thousand Oaks, CA: Sage Publications.

Cavanaugh, C.S. (2001). The Effectiveness of Interactive Distance Education Technologies in K-12 Learning: A Meta-Analysis. *International Journal of Educational Telecommunications, 7*(1), 73-88. Norfolk, VA: Association for the Advancement of Computing in Education (AACE).

Chambers, E. A. (2003). Efficacy of educational technology in elementary and secondary classrooms: *A meta-analysis of the research literature from 1992–2002.* Ph.D. dissertation, Southern Illinois University at Carbondale. Retrieved December 27, 2016 from ProQuest Digital Dissertations database. (Publication No. AAT 3065343).

Clark, R.C., & Mayer, R.E. (2008). Learning by viewing versus learning by doing: Evidence-based guidelines for principled learning environments. Performance Improvement, 47, 5–13.

Downes, S (2005). Semantic networks and social networks. The Learning organization, Vol 12 Issue 5, pp 411-417

Ettinger, A., Holton V., & Blass, E. (2006) "E-Learner Experiences: A Lesson on In-House Branding," Industrial & Commercial Training, Vol. 38, No. 1, pp. 6-33.

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. Journal of Marketing Research, 18, 382-388. http://dx.doi.org/10.2307/3150980

Hardaker, Glenn and Smith, David C. (2000) elearning innovation through the implementation of an internet supported learning environment. Journal of educational technology and society, 3 (3). pp. 422432. ISSN 14364522

Hayduk, L. A. (1987). Structural equation modeling with LISREL. Hillsdale, NJ: Lawrence Erlbaum Associates.

Herrington, J., Reeves, T.C. and Oliver, R. (2010) A Guide to Authentic eLearning. Routledge, New York

Johnson, G.M. (2005). Student Alienation, Academic Achievement, and WebCT use. Educational Technology and Society, 8, 179-189

Kearsley, G. (2000). Online education: learning and teaching in cyberspace. Belmont, CA: Wadsworth.

Liaw, S. S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. Computers & Education, 51(2), 864-873.

Liu, X., Magjuka, R. J., Bonk, C. J., & Lee, S. (2007). Does sense of community matter? An examination of participants' perceptions of building learning communities in online courses. Quarterly Review of Distance Education, 8(1), 9-24

Rosenberg, M. J. (2006). Beyond e-learning: Approaches and technologies to enhance organizational knowledge, learning, and performance. San Francisco: Pfeiffer

Roy, K. (2006). The impact of learning styles on interactivity in asynchronous e-learning. Perf. Iprov., 45: 21–26.

Tavangarian, D., Leypold, M. E., Nölting, K., Röser, M., & Voigt, D. (2004). Is e-Learning the solution for individual learning? Electronic Journal of e-Learning, 2(2), 273−280.