International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2020, Vol. 16, Issue 2, pp. 68-83

The Impact of Self-Efficacy and Need for Achievement on Management Students' Perceptions Regarding Web Based Learning Resources

Vikas Gautam
ICFAI Business School Hyderabad, India

Shalini Khandelwal
ICFAI Business School Gurgaon, India

Riyanka Dwivedi
Robotics Architect, Bangaluru, Karnataka, India

ABSTRACT

The increasing popularity of computers and computer networks has facilitated the use of Web Based Learning Resources (WBLR) in education. Many institutions are investing in the development of WBLR to facilitate the learning process, and WBLR have become very popular among management students. The present study investigated the impact of self-efficacy and need for achievement on management students' perception regarding Web Based Learning Resources. Our study results confirmed a significant impact of self-efficacy on WBLR. However, we did not find evidence of a significant impact on need for achievement on WBLR. The sample comprised of 150 respondents. Our findings imply that students' experience of seeking help from informal online channels is significant when they actively participate in a course that uses WBLR.

Key Words: *Web Based Learning Resources, self-efficacy, e-learning, need for achievement*

INTRODUCTION

Web Based Learning Resources (WBLR) have the ability to provide rich learning environments in a democratic and interactive manner. With better technologies evolving day by day, WBLR have become more accessible to facilitate learning. According to Kay et al., (2009), Web Based Learning Resources may be defined as "Interactive Web based tools that support learning by enhancing, amplifying, and guiding the cognitive processes of learners". Discussion forums via email, videoconferencing, and live lectures (video streaming) are a few examples of WBLR. WBLR provides an enterprise solution to course administration problems associated with the storage, collation and administration of teaching and learning resources.

Institutions and corporate trainers are finding it more beneficial to move their courses online and students are finding these interfaces convenient for anywhere, anytime learning. Through the effective use of such resources, meaningful learning environments and relevant learning opportunities can be created by carefully examining the issues that are important to students (Khan, 2000).

Developing an understanding of the demographic and personality differences among students that may affect their perception of the various dimensions of WBLR may be necessary to design and implement an effective learning management system. Web-based learning benefits students in making their selection of better subjects that subsequently improves their performance (Mahajan and Kalpana, 2018). A comprehensive understanding of WBLR and the impact on cognitive engagement of learners are essential to the successful implementation of the online learning experience. Learning satisfaction leads to student engagement with online resources,

which depends on the quality of the web based learning system and its usefulness to fulfill the need of the students to further enhance their effective learning.

WBLR allows instructors to test the ability of students to apply, synthesize and think outside the box. Web based resources include the design for a robust use of wikis, blogs, integrating blogs across different courses, using blogs to increase off-campus student involvement and even using video and wiki technology to engage learners.

Objectives of the Study

The current study intends to achieve the following objectives:

1. To explore and confirm the various dimensions of Web Based Learning Resources in management studies.
2. To understand the management students' perception regarding various dimensions of Web Based Learning Resources.
3. To investigate the impact of Need for Achievement and Self-Efficacy on management students' perception regarding various dimensions of Web Based Learning Resources.

LITERATURE REVIEW

Web Based Learning Resources (WBLR)

Web-based learning, online education, virtual learning environment, computer mediated learning are the best known synonymous for e-learning and web based learning resources (Khan, 2001). Web-based learning resources are widely being adopted across the world to empower students as an easy to use, flexible and interactive platform for knowledge creation and sharing. The rapid evolution of massive open online courses (MOOCs) starting in 2012 has brought the potential of these resources to the forefront in all educational processes. WBLR could serve as a useful platform for supporting and engaging learners in the educational experience, as a range of learning activities can be built into a WBLR based learning management system. Use of WBLR may help students develop skills to appraise and select trustworthy online study materials and better understand the concepts while bypassing rote learning (Lin, 2019).

Most of the Higher Education Institutions that are offering their courses use an online education paradigm. Governments or teaching institutes are encouraged to establish digital learning centers and develop digital libraries in which there are many well-prepared instructional databases for learners to search or consult (Hsu et al,. 2011). Some WBLR systems, such as *WebCT*, *Learnwise* and *Blackboard*, have been created commercially, whereas others have been developed in-house by educational institutions. These interfaces utilize formative assessment questions, such as multiple choice and fill-in the blanks, and collaborative learning activities such as discussion forums (Lane et al., 2006).

When WBLR technology is adapted and customized according to the end user convenience, a Learning Management System (LMS) is formed. LMS is a collection of web based learning resources and tools available through a shared administrative interface. It can be visualized as the platform which assembles online courses for the purpose of teaching and learning. It has been found that investing in a structured knowledge base significantly improves the performance of the high-achieving students in comparison with those using the open resources WBLR (Ching-Kun Hsu, et al, 2012).

Although, WBLR is a very attractive approach for e-learning, its growth rate is low and there are many cases of its failure. The main factor in the failure of WBLR implementation is the student's satisfaction and engagement. There is a need to determine the ways in which students' engagement and participation with WBLR can be increased to reap the advantages from the implementation of such systems. These systems can encourage deep learning experiences by offering feedback that motivates the learner to read more widely around the subject matter.

Advantages of WBLR

The ease of interaction between instructor and learner or learner to learner is the most significant advantage of WBLR technology (Sun et al., 2008). The use of the online learning system shifts control and responsibility to the learner, thus developing independence and autonomy in the learning experience (Chou and Liu, 2005). Studies also found that learning engagement was higher when using a WBLR system than when using traditional models of learning. WBLR systems allow for interaction and communication, and the ability of the learner to post/email thoughts and reflections instantaneously enables them to engage more with the learning material. Reflective skills can thus be developed, as there is a greater amount of time for the learner to interact with the learning material (Johnson and Johnson, 2005).

The provision of web**-**based problem-solving instructions has the potential to enhance and sustain the problem-solving skills of the learners. Searching for information to solve problems has been categorized as involving higher-order cognitive processes. Digital libraries can be put into use in conducting web**-**based problem-solving activities more widely and are worth developing. Indeed, students who fully engage with WBLR systems are found to encounter higher levels of deep learning and significantly higher levels of strategic learning as compared to traditional learning (Dale and Lane, 2007).

The use of e-learning systems also gives students a sustainable competitive advantage among their competitors. From this perspective the Learning theories of classical (Pavlov, 1903) and operant conditioning (Skinner, 1938) can be applied. This helps with the design of better learning interfaces which motivates students for self-learning. When compared with students who did not use WBLR systems, research has shown a greater sense of 'connectedness' among students, and between staff and students, who use WBLR systems, leading to higher completion rates (Enjelvin, 2005; Pavey and Garland, 2004; Thurston, 2005).

Some important online tools of WBLR that help instructors and trainers to get their students to think analytically are online courses**,** the online quiz facility, feedback surveys at the end of a course or assignments that help to evaluate the knowledge of the learners. Online games such as logic problems, crosswords and Sudoku help learners strengthen their analytical skills. Data collected in the WBLR system can be used for analyzing the way courses and students perform (Gardner et al., 2002). WBLR can also provide grading and analysis of the test results for instructors. Instructors can track which questions were answered correctly or incorrectly and accordingly design the necessary interventions. The addition of multimedia objects such as sound clips, pictures and animations can provide an enhanced learning experience. Arbaugh, (2005) recommends the increased use of a variety of media on course websites and claims that the posting of course materials in a variety of formats enhances the web-based course experience. The richness of content may be enhanced by using a combination of visual, audio, and text based information.

Factors affecting the use of WBLR

The extent to which learners engage with WBLR systems is dependent on their design and use. Research suggests that a number of factors determine interaction with a WBLR system, including

the student learning style and motivation, and the content, design and functionality of the WBLR system. The student's attitude towards WBLR and interaction with other students and the friendliness and ease of use of the interface for online education are very important factors for students. They feel good and relaxed when learning with the new tools and methods. Students in higher education are more interested in the quality of the course content. They need more information when compared to the traditional learning environment. Technical flaws in the online learning interface leads towards student anxiety. These factors affect student satisfaction towards online learning and are directly associated with the WBLR system implementation (Malik, 2009).
The design and implementation of the pedagogy used in the WBLR system are critical factors affecting student acceptance and usage frequency (Kinshuk et al., 2001). Sun et al., (2008) noted that learner's computer anxiety, instructor attitude toward e-learning, e-learning course flexibility, e-learning course quality, perceived usefulness, perceived ease of use, and diversity in assessments are the critical factors a□ecting learners' perceived satisfaction and engagement with WBLR.

Sumak et al., (2011) and Jong and Wang, (2009) suggested that the social influence from interactivity leads to knowledge sharing and motivation among peers to use WBLR. It was found that performance expectancy, attitude toward using technology, facilitating conditions, self-efficacy, and social influence have significant influence on behavioural intention of students to use WBLR. Jong and Wang, (2009) concluded that attitude, self-efficacy and anxiety to strive are indicators of behavioral intention and satisfaction towards WBLR. Previous studies relate to the UTAUT theory which supports the view that satisfaction with ease of use (effort expectancy), flexibility, Internet proficiency, and academic achievement (performance expectancy) leads to behavioral intention to use web based learning resources and ensures students engagement.

Research by Liaw, (2008) indicated that behavioral intention is dependent on system quality or interactive-learning activities which are supported by system quality and interactive collaboration, leading to knowledge sharing and creation that help to achieve effective-learning. Students' positive recognition of system quality and usefulness enhance behavioral intention to use e-learning and their satisfaction level.

The study by Lau and Woods, (2009) contributes to the understanding of user acceptance of learning objects. Both perceived usefulness and perceived ease of use were found as significant determinants. The technical quality, content effectiveness, self-efficacy of users, Internet experience, perceived usefulness, and behavioral intention impact the actual use of WBLR.

Effective-learning with use of web based learning resources is also affected by individual diversity and difference in age groups, experience, perception of students (Wright, 1936). This indicates that levels of student engagement may be different for various learners. The engagement of students is affected by methodologies of learning, evaluations, course design, faculty, and technical infrastructure (Lemos et al., 2012). Some strategies being explored to increase student engagement in online courses are; meaningful participation through use of discussion boards based on relevant questions and instant feedback response. Moreover, students are more engaged when they can collaborate and feel part of a community and have a one on one connection to peers and work together on documents using one of the many free web collaboration tools, twitter discussions, social bookmarking tools, blog posts, infographics, concept maps, multimedia presentations, and many such tools which are freely available online.

RESEARCH METHODOLOGY

Sample

The sample for this study was drawn from a management institute located in the National Capital Region (NCR) and consisted of 156 second-year students enrolled in the two-year MBA program.

Data Collection

A specially developed 40-item questionnaire was personally administered by the researcher in classrooms after the classes were over.

The break-down of the 40 items on the questionnaire was as follows:

(a) WBLR	22 items
(b) Personality Attributes	
i. Self-Efficacy	9 items
ii. Achievement Need	9 items
Total:	40 items

The 9-item scale (adapted from AMI by Schuler, 2002) was used to measure need for achievement. 9 items were taken from the Self-Efficacy Scale by Schwarzer and Jerusalem (1995). 22 items were used to measure different aspects of Web Based Learning Resources. These study items were measured on a 4 point Likert's scale (0 = Not at all True, 1 = Somewhat True, 2 = Largely True, 3 = Absolutely True). The student demographic variables of Age (1); Gender (2); Graduation (3) and Rural/Urban Background (4) were considered. Students' WBLR Knowledge (5) WBLR frequency (6) and CGPA (7) were also included in the study. The distribution of frequencies is shown in Table 1 below.

Out of the total of 156 students, 6 students replied 'No' in regard to WBLR knowledge. The data for these 6 students were excluded and the results from a final sample of 150 students was subjected to further analysis.

Table 1: *Data Frequency Table*

S. N.	Parameter	N	Range	% Distribution
1	Age	156	21 - 28	23 years = 57%
2	Gender	156	1 – 2	Male = 63.5% Female = 36.5%
3	Graduation	156	1 – 6	Engineers = 23.1% Science = 5.8% Commerce = 49.4% Arts = 1.9% Bus. Admn. = 16.7% Others = 3.2%

4	Rural Urban	156	1 - 4	Village = 1.9% Small Town = 7.7% City = 53.8% Metro = 36.5
5	WBLR Knowledge	156	1 - 2	Yes = 96.2% No= 3.8%
6	WBLR Frequency	150	1 - 5	Monthly = 18.7% Bimonthly = 10.7% Weekly = 18.7% Twice a week = 14.0% Daily = 37.3%
7	CGPA	156	4 - 9.53	

Data Analysis

The responses to the questionnaire were analyzed using the following multivariate statistical analysis techniques: Exploratory Factor Analysis using IBM SPSS 21.0; Structural Equation Modeling using IBM AMOS 21.0).

FINDINGS

Exploratory Factor Analysis (EFA)

Principal Component Analysis (PCA) was carried out with the help of IBM SPSS to explore the underlying factors associated with the items of Web Based Learning Resources (WBLR). The KMO measure of sampling adequacy was first computed to determine the suitability of the sample size for a better factor structure.

Table 2: *KMO and Bartlett's Test of Sphericity*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.899
Bartlett's Test of Sphericity	Approx. Chi-Square	1395.721
	df	190
	Sig.	0.000

A KMO value of 0.899 indicates an adequate sample size for the study. The significant value of Bartlett's Test of Sphericity indicates that the item to item correlation matrix is not an identity matrix. Hence factor analysis can be conducted for the study variables.

Table 3: *Exploratory Factor Analysis Results*

S.N.	Factor	Item Number	Eigen Value	% Variance Extracted	Factor Loadings	Cronbach's Alpha
1	Availability	42	7.797	38.986	0.524	0.826
		44			0.650	
		46			0.609	
		47			0.661	
		48			0.637	
		51			0.681	
		37			0.554	
		40			0.658	

2	Easiness	41	1.531	7.654	0.680	0.756
		43			0.664	
		45			0.530	
3	Usefulness	34	1.419	7.097	0.748	0.836
		35			0.702	
		36			0.740	
		38			0.629	
		39			0.566	
4	Quality	49	1.164	5.819	0.679	0.764
		50			0.749	
		52			0.505	
		53			0.648	
Cumulative Variance Explained by all 4 Factors						59.555
Cronbach's Alpha for Total Scale (all 20 items)						0.916

It can be seen from the above table that exploratory factor analysis provided a four factor solution by explaining 59.55% of the variance in the study construct. Two items were dropped due to low factor loadings. The first factor explained 38.986% of the variance with Eigen Value 7.797; the second factor explained 7.654% of the variance with Eigen Value 1.531; while the third factor explained 7.097% of the variance with Eigen Value 1.419; and the fourth factor explained 5.819% of the variance with Eigen Value 1.164. Based on thematic analysis, the four named factors were *availability, easiness, usefulness and quality*. The reliability analysis was conducted and it was found that the Cronbach's alpha values range from 0.756 to 0.836. Moreover, overall the Cronbach's alpha was 0.916 for the construct of WBLR. Hence, the reliability of the research instrument was established.

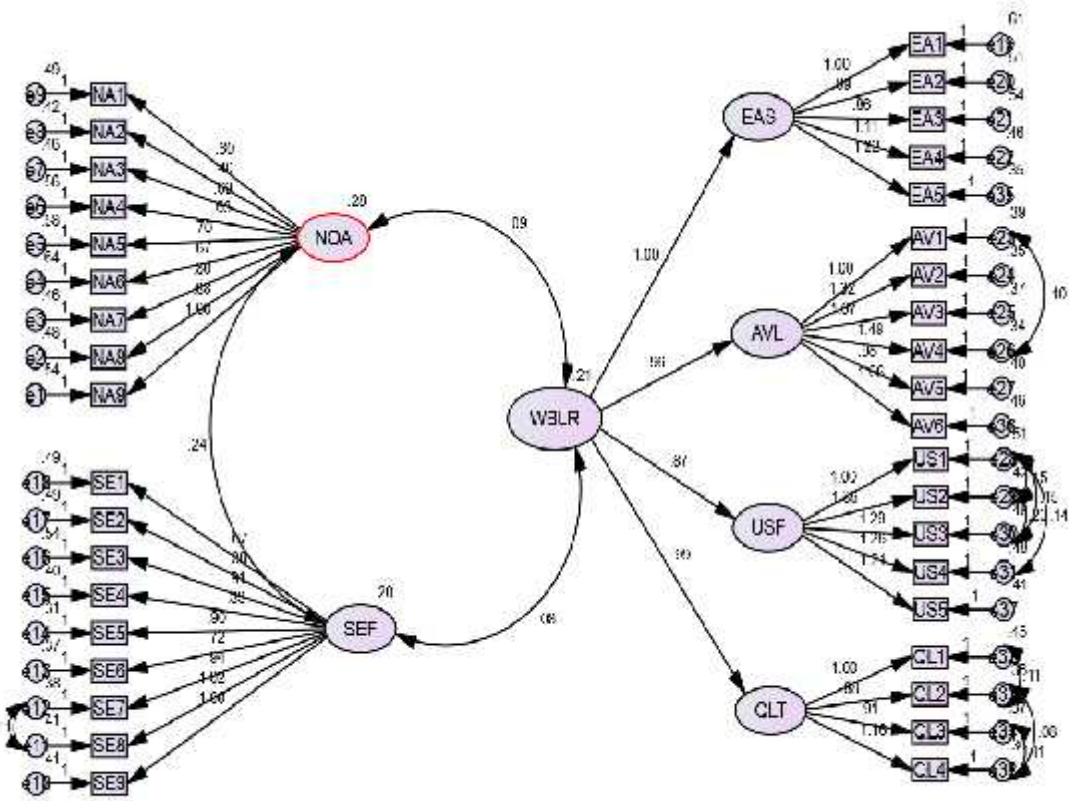

Figure 1: *Results - Confirmatory Factor Analysis*

Table 4: *Regression Weights: (Group number 1 - Default model)*

			Estimate	S.E.	C.R.	P	Label
EAS	<---	WBLR	1.000				
AVL	<---	WBLR	.956	.180	5.313	***	par_29
USF	<---	WBLR	.871	.183	4.771	***	par_30
QLT	<---	WBLR	.986	.188	5.242	***	par_31
NA9	<---	NOA	1.000				
NA8	<---	NOA	.885	.157	5.637	***	par_1
NA7	<---	NOA	.802	.148	5.423	***	par_2
NA6	<---	NOA	.668	.154	4.341	***	par_3
NA5	<---	NOA	.700	.151	4.628	***	par_4
NA4	<---	NOA	.626	.144	4.343	***	par_5
NA3	<---	NOA	.693	.140	4.966	***	par_6
NA2	<---	NOA	.403	.117	3.444	***	par_7
NA1	<---	NOA	.603	.136	4.426	***	par_8
SE9	<---	SEF	1.000				
SE8	<---	SEF	1.018	.178	5.729	***	par_9

			Estimate	S.E.	C.R.	P	Label
SE7	<---	SEF	.939	.167	5.625	***	par_10
SE6	<---	SEF	.719	.148	4.868	***	par_11
SE5	<---	SEF	.900	.155	5.788	***	par_12
SE4	<---	SEF	.827	.159	5.195	***	par_13
SE3	<---	SEF	.811	.174	4.669	***	par_14
SE2	<---	SEF	.382	.143	2.675	.007	par_15
SE1	<---	SEF	.667	.158	4.229	***	par_16
EA1	<---	EAS	1.000				
EA2	<---	EAS	.890	.184	4.843	***	par_17
EA3	<---	EAS	.859	.183	4.682	***	par_18
EA4	<---	EAS	1.110	.203	5.477	***	par_19
AV1	<---	AVL	1.000				
AV2	<---	AVL	1.317	.197	6.680	***	par_20
AV3	<---	AVL	1.072	.176	6.100	***	par_21
AV4	<---	AVL	1.489	.186	8.029	***	par_22
AV5	<---	AVL	.980	.170	5.757	***	par_23
US1	<---	USF	1.000				
US2	<---	USF	1.358	.209	6.508	***	par_24
US3	<---	USF	1.288	.207	6.216	***	par_25
US4	<---	USF	1.260	.207	6.099	***	par_26
QL1	<---	QLT	1.000				
QL2	<---	QLT	.880	.134	6.569	***	par_27
QL3	<---	QLT	.913	.162	5.638	***	par_28
EA5	<---	EAS	1.220	.207	5.881	***	par_32
AV6	<---	AVL	1.061	.183	5.790	***	par_33
US5	<---	USF	1.211	.229	5.293	***	par_34
QL4	<---	QLT	1.157	.183	6.306	***	par_35

Table 5: *Fit Indices*

S. N.	Goodness of Fit Index	Value	Acceptable Threshold Value
1	CMIN	1016.627	-
2	Df (Degrees of Freedom)	653	-
3	CMIN/DF	1.557	good if < 3
4	GFI (Goodness of Fit Index)	0.877	Range 0 -1, good if more towards 1
5	PRATIO (Parsimony Ratio)	0.929	good if ≥ 0.90
6	CFI (Comparative fit Index)	0.914	good if ≥ 0.90
7	RMSEA (Root Mean Square Error of Approximation)	0.060	good if < 0.08

8	P Close	0.013	good if close to or equal to 1
9	RMR (Root Mean Squared Residual)	0.047	good if < 0.08
10	ECVI (Expected Cross Validation Index)	Default Model = 7.694 ECVI value for Saturated Model = 9.561 ECVI value for Independence Model = 17.617	Default model should have least ECVI value
		Source: Author Compilation	**Source:** Hair et al., (2010)

The Confirmatory Factor Analysis model with two first order constructs and one second order construct had a total of 88 distinct parameters and 741 distinct sample moments. The model was identified and all the study parameters and standard errors were in acceptable limits. The statistical significance of the parameter estimates was established as the test-statistic (t-value) in each case was greater than the threshold limit of 2.58. It can be seen from Table 5 above that all goodness-of-fit indices exceeded the recommended threshold levels (Browne and Cudeck 1993; Bagozzi and Yi 1988). Hence, the fitness of the study model was established.

Table 6: *Convergent & Discriminant Validity*

	CR	**AVE**	**MSV**	**ASV**	**SEF**	**NOA**	**WBLR**
SEF	0.739	0.593	0.432	0.457	**0.770**		
NOA	0.709	0.618	0.421	0.443	0.414	**0.786**	
WBLR	1.000	1.000	0.144	0.158	0.398	0.361	1.000

The construct validity of measurement constructs must be ensured. In this study convergent validity was checked by reviewing factor loadings, Average Variance Extracted (AVE) and Composite Reliability (CR) as suggested by Hair et al., (2010). It is clearly evident from the above table that all factor loadings and composite reliability measures surpassed the 0.70 criteria. In addition, the average variances extracted (AVEs) in the case of all three current study constructs were all above the 0.50 level (Bagozzi and Yi 1988; Fornell and Larcker 1981), thus indicating high levels of convergence among the indicators in measuring their respective constructs.

The procedure suggested by Fornell and Larcker (1981) and Hair et al., (2010) was followed to assess Discriminant Validity. The procedure states that the AVE should be greater than Maximum Shared Variance (MSV) or AVE should be greater than Average Shared Variance (ASV), Average Shared Variance (ASV) should be greater than Maximum Shared Variance (MSV) and the square root of AVE should be greater than the correlation among the constructs. In the current study, all the AVEs were found to be greater than MSVs as well as ASVs. Also the square

root of AVE was greater than the inter-correlation of the study constructs. Hence, the constructs passed the Discriminant Validity test.

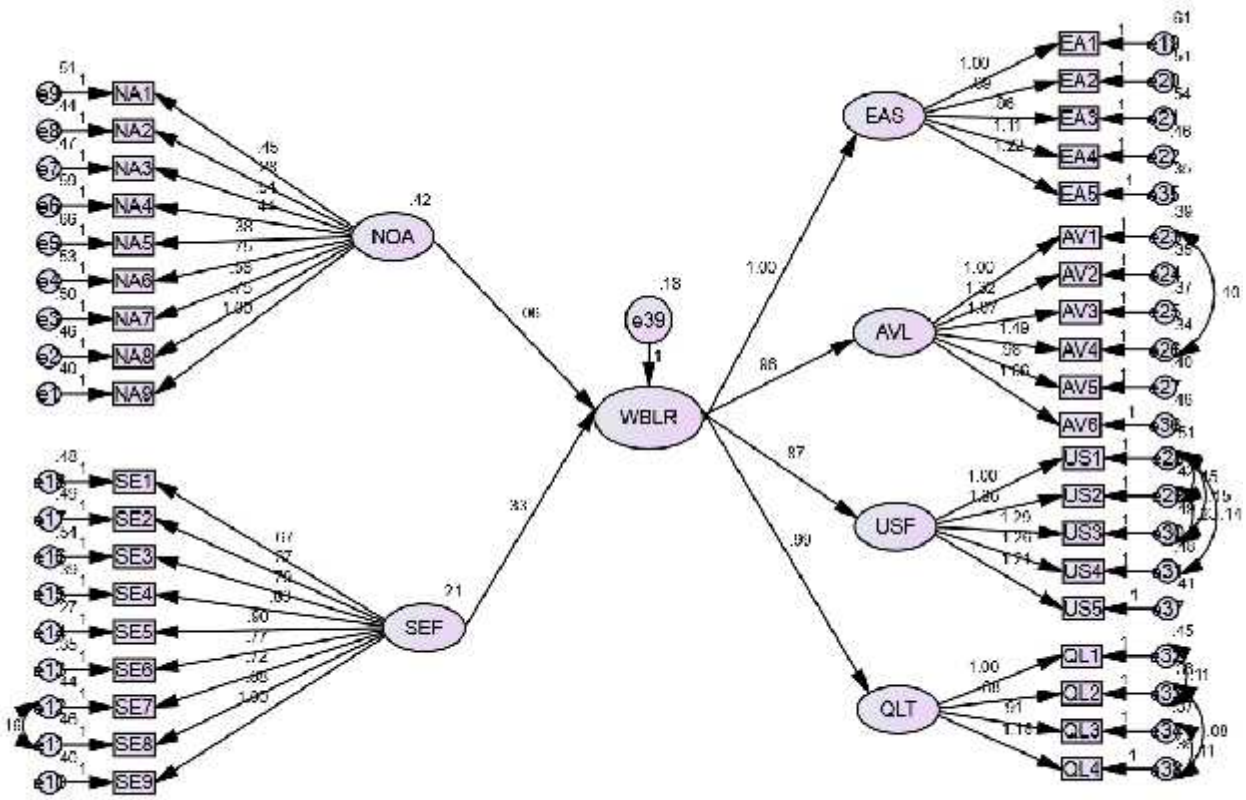

Figure 2: *Results - Structural Equation Modelling*

Table 7: *Fit Indices*

S. N.	Goodness of Fit Index	Value	Acceptable Threshold Value
1	CMIN	1128.431	-
2	Df (Degrees of Freedom)	654	-
3	CMIN/DF	1.725	good if < 3
4	GFI (Goodness of Fit Index)	0.867	Range 0 -1, good if more towards 1

5	PRATIO (Parsimony Ratio)	0.930	good if ≥ 0.90
6	CFI (Comparative fit Index)	0.907	good if ≥ 0.90
7	RMSEA (Root Mean Square Error of Approximation)	0.068	good if < 0.08
8	P Close	0.000	good if close to or equal to 1
9	RMR (Root Mean Squared Residual)	0.073	good if < 0.08
10	ECVI (Expected Cross Validation Index)	Default Model = 8.403 ECVI value for Saturated Model = 9.561 ECVI value for Independence Model = 17.617	Default model should have least ECVI value
		Source: Author Compilation	**Source:** Hair et al., (2010)

The structural model with 2 first order constructs and one higher order construct with causal relationships had a total of 87 distinct parameters and 741 distinct sample moments. The model was identified and a minimum was achieved. All the study parameters and standard errors were within acceptable limits. The statistical significance of the parameter estimates was established as the test-statistic (t-value) in each case was greater than the threshold limit of 2.58. It can be seen from the table that all goodness-of-fit indices exceeded the recommended threshold levels (Browne and Cudeck 1993; Bagozzi and Yi 1988). Hence the structural model was confirmed.

Table 8: *Structural Model Results*

Relationship	**Unstandardized Estimates**	**Standardized Estimates**	**S. E.**	**C. R.**	**p-value**	**R-Square**
WBLR <--- NOA	0.064	0.092	0.066	0.975	0.330	0.125
WBLR <--- SEF	0.333	0.341	0.111	2.989	0.003	
						Source: Author Compilation

The results shown in Table 8 for the higher order Structural Equation Modeling indicate that self-efficacy had a positive and significant impact on Web Based Learning Resources (β = 0.341, p =

0.003), whereas need of achievement was not significant for impact on Web Based Learning Resources (β = 0.092, p = 0.975. Therefore, it can be concluded that the study hypothesis (SEF significantly impacts Web Based Learning Resources) was supported and the other study hypothesis (NOA significantly impacts Web Based Learning Resources) was not supported at 5 percent level of significance.

CONCLUSION

Web based learning resources are accessible to students using the technology. However, they may experience perceived risks during the transactional phase. Moreover, a positive perception about various dimensions of WBLR will result when the students use these resources frequently rather than occasionally. Hence self-efficacy as a variable becomes very critical. Our empirical study results confirmed a significant impact of self-efficacy on WBLR. However, we found the need of achievement did not have a significant impact on WBLR. These results may be attributed to the fact that web based learning resources are not difficult to access and at the same time it is not mandatory for achievement oriented students to only learn through web based resources.

For improving the frequency of use of WBLR, effort should be focused on student attention, content relevance, inclusive environments, challenging tasks and attainment of a sense of achievement. To be engaged successfully in an online environment, students need to feel in control of their learning processes and be committed to their own learning. Giving students opportunities to interact with the content, share what they learn with others, and explore according to their interests will encourage them to stay engaged and participate meaningfully.

It is suggested that institutions need to invest in an easy to use, content rich, accessible knowledge base and use technology interfaces to improve the learning process. Moreover, future technologies need to develop robust solutions to reinforce self-efficacy as a factor affecting the perception about web based learning resources in a self-directed learning environment.

Scope for Future Research

The authors strongly suggest that open-ended questionnaires and/or interviews be used to gain more insights into students' web based learning behaviors in further studies. Studies concerning the gap between use of WBLR for web-based learning in general and WBLR for a specific course may offer potential insights for enhanced implementation of teaching and learning in online courses.

REFERENCES

Arbaugh J. B. (2005) 'Is there an Optimal Design for On-Line MBA Courses'? *Academy of Management Learning & Education*, vol. 4, no. 2, pp. 135–149.

Bagozzi, R.P. and Yi, Y. (1988) 'On the Evaluation of Structural Equation Models'. *Journal of the Academy of Marketing Science*, vol. 16, no. 1, pp. 74-94.

Browne, M. W., and Cudeck, R. (1992) 'Alternative Ways of Assessing Model Fit. *Sociological Methods and Research,* vol. 21, pp. 230--258.

Ching-Kun Hsu, Gwo-Jen Hwang, Chien-Wen Chuang and Chih-Kai Chang (2012) 'Effects on learners' performance of using selected and open network resources in a problem-based learning activity', *British Journal of Educational Technology*, vol. 43, no 4, pp. 606–623.

Chou, S-W., and Liu, C-H. (2005) 'Learning effectiveness in a Web-based virtual learning environment: A learner control perspective. *Journal of Computer Assisted Learning*, vol. 21, no. 1, pp. 65-76.

Dale, C. and Lane, A.M. (2007) 'A wolf in sheep's clothing? An analysis of student engagement with virtual learning environments', *Journal of Hospitality, Leisure, Sport and Tourism Education*, vol. 6, pp. 100-108.

Enjelvin, G. (2005) 'Investigating VAT (Value-Adding Technologies) and effectiveness in a French Department', *Journal of Further and Higher Education*, vol. 29, no. 2, pp. 155-167.

Fornell and Larcker. D. F. (1981) 'Structural Equation Models with Unobservable Variables and Measurement Errors: Algebra and Statistics. *Journal of Marketing Research*, vol. 18, pp. 382-388.

Gardner L., Sheridan D. and White D. (2002) 'A web-based learning and assessment system to support flexible education', *Journal of Computer Assisted Learning*, vol. 18, pp. 125-136.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. & Tatham, R.L. (2010). *Multivariate data analysis,* 6th Edition. Upper Saddle River, New Jersey: Pearson Prentice Hall.

Hsu, J.-L., Hwang, W.-Y., Huang, Y.-M., and Liu, J.-J. (2011) 'Online Behavior in Virtual Space: An Empirical Study on Helping', *Educational Technology & Society*, vol. 14, no. 1, pp. 146–157

Johnson, D. W., & Johnson, R. T. (2005)' New developments in social interdependence theory', *Psychological Monographs*, vol. 131, no. 4, pp. 285-358.

Jong Din and Wang Tzong-Song (2009) 'Student acceptance of web-based learning system', ISBN 978-952-5726-00-8 (Print), 978-952-5726-01-5 (CD-ROM), *Proceedings of the 2009 International Symposium on Web Information Systems and Applications (WISA'09)*, Nanchang, P. R. China, May 22-24, 533-536.

Kay, R., Knaak, L., & Petrarca, D. (2009) 'Exploring teachers' perceptions of web-based learning tools', *Interdisciplinary Journal of E-Learning and Learning Objects*, vol. 5, no. 1, pp. 27-50.

Khan, Badrul, H. (2000) 'Discussion of resources and attributes of the web for the creation of meaningful learning environments', *Cyberpsychology & Behavior*, vol. 3, no. 1, pp. 17-23.

Kinshuk; Patel A. & Russell D. (2001) 'Intelligent and adaptive systems, In B. Collis, H. H. Adelsberger & J. Pawlowski (Eds.) *Handbook on Information Technologies for Education and Training*, Springer, 79-92 (ISBN 3-540-67803-4)

Khan, B. H. (2001) '*A framework for web based learning'*, Engelwood, CliFFs, NJ: Educational Technology Publications.

Kirsten R. Butcher and Tamara Sumner. (2011) 'Self-directed learning and the sense making paradox', *Human – Computer Interaction*, vol. 26, no. 1-2, pp. 123–159.

Lane, P.J., Koka, B.R. and Pathak, S. (2006) 'The reification of absorptive capacity: A critical review and rejuvenation of the construct, *Academy of Management Review*, vol. 31, no. 4, pp. 833- 863.

Lau Siong-Hoe and Woods Peter C. (2009) 'Understanding learner acceptance of learning objects: The roles of learning object characteristics and individual differences', *British Journal of Educational Technology*, vol. 40, no. 6, pp. 1059–1075

Lemos Susana and Pedro Neuza, (2012)' Students' expectation and satisfaction in postgraduate online courses, *ICICTE 2012 Proceedings,* pp. 568-580

Liaw Shu-Sheng, (2008) 'Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system, Elsevier, *Computers & Education,* vol. 51, pp. 864–873.

Lin, H. (2019) 'Teaching and learning without a textbook: Undergraduate student perceptions of open educational resources', *International Review of Research in Open and Distributed Learning*, vol. 20, no. 3, pp. 1-19.

Mahajan, M. V., and Kalpana. R. A. (2018), 'Study of students' perception about e-learning', Indian Journal of Clinical Anatomy and Physiology, vol. 5, no. 4, pp. 501-507.

Malik, M.W., (2009), Student satisfaction towards E-Learning: Influential Role of key factors', *proceedings of 2nd CBRC*, Lahore, Pakistan, November 14, 1-7.

Pavey, J. and Garland, S. W. (2004), 'The integration and implementation of a range of activities to enhance students' interaction and learning, Innovations', *Education and Teaching International*, vol. 41, no. 3.

Pavlov, I. (1903) 'The Experimental Psychology and Psychopathology of Animals, *The 14th International Medical Congress*, Madrid, Spain, April 23-30, 1903.

Schuler, H., Thornton, G.C.III., Frintrup, A., and Mueller-Hanson, R. (2002). *Achievement Motivation Inventory (AMI)*. Göttingen, Bern, New York: Hans Huber Publishers.

Schwarzer, R. and Jerusalem, M. (1995) '*Generalized Self-Efficacy Scale*. In J. Weinman, S. Wright, and Johnston, Measures in health psychology: A user's portfolio. Causal and Control Beliefs (pp.35-37). Windsor, UK: Nfer-Nelson

Skinner, B. F. (1938) '*The Behavior of organisms: An experimental analysis*. New York: Appleton-Century.

Šumak Boštjan, Heričko Marjan, Heričko Maja and Polančič Gregor, (2011) 'Factors Affecting Acceptance and Use of MOODLE: An Empirical Study Based on TAM', *Informatica,* vol. 35, pp. 91–100.

Sun, Pei-Chen, Ray J. Tsai, Finger Glenn, Chen Yueh-Yang and Yeh Dowming, (2008) 'What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction', Elsevier, *Computers & Education*, vol. 50, pp. 1183–1202.

Thurston, A. (2005) 'Building online learning communities', *Technology Pedagogy and Education*, vol. 14, no. 3, pp. 353-369.

Wright, T. P., (1936)' Factors Affecting the Cost of Airplanes', *Journal of Aeronautical Sciences*, vol. 3, no. 4, pp. 122–128.