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Electronic resources usage by postgraduates at the University of Colombo: Identifying the critical success factors

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E-resources have exploded in popularity and usage by helping users in retrieving accurate, relevant and timely information as and when required for their learning and research needs. This case study was carried out at the University of Colombo to investigate the Critical Success Factors (CSFs) on e-resources usage of postgraduates. A questionnaire based survey was carried out using 302 postgraduates belonging to seven faculties. Exploratory factor analysis with Verimax rotation was employed to identify the CSFs on e-resource usage and multiple regression analysis was carried out to determine the relationship of those identified factors with overall e-resource usage. Factor analysis identified nine factors which affect on e-resources usage. Among the nine factors, postgraduates identified "Technology" as the most critical factor in using e-resources. Library support, information literacy, computer competency, usefulness and user attitudes are identified as other CSFs for using e-resources for their learning activities.

Keywords: Electronic resources, Electronic resources usage, Critical Success Factors, Higher education

Introduction

Networked computers provide an unparalleled capacity to access and manage large amounts of information[1]. Today, students have access to vast amounts of information through a variety of sources in different formats. Among them, e-resources have received greater attention as they enhance the learning process by providing relevant information and by allowing an interactive communication medium. Different people may have different impression or understanding of the term e-resources. According to the Online Dictionary of Library and Information Science by Reitz[2], e-resources are materials consisting of data and/or computer program(s) encoded for reading and manipulation by a computer or by using a peripheral device directly connected to the computer, such as a CD-ROM drive, or remotely via a network, such as the internet. The commonly available e-resources include, e-journals, e-books, online databases, CD-ROMs and OPACs. Although e-resources have been grouped into different categories by different authors, depending on format, functions, delivery method, content and subject coverage, some of them do not fall neatly into one category.

Being the oldest and the metropolitan university in Sri Lanka, University of Colombo provides enormous opportunities for postgraduate education with its seven faculties and 41 academic departments. Specially, Faculty of Graduate Studies and Faculty of Management and Finance are highly recognized for their quality postgraduate courses throughout the country. University administration is in the process of providing all the services to its postgraduates for having easy access to information and providing new learning environments such as e-learning and m-learning etc. The University of Colombo library system has increased its budget allocation to provide e-resources for students and staff over the last five years. The Library of the University of Colombo has acquired university-wide access to several large online full-text electronic databases through International Network for the Availability of Scientific Publication (INASP) and a Program for the Enhancement of Research Information (PERI) with the financial assistance of the Swedish International Development Agency (SIDA) until 2009. Several

thousand peer reviewed full-text periodicals from different publishers and databases such as Blackwell Publishers, EBSCO Host, Mary Ann Liebert, Wiley, American Society of Agricultural & Biological Engineering, CABI Global Health and World Bank Publications can be accessed. Other than that, the University subscribes JSTOR with the aid of Ford Foundation, Emerald and Hein Online using treasury funds allocated to the Library.

Though university administration and the library spends millions to make best use of e-resources, it has not been achieved so far, as evidenced by previous surveys[3] and user statistcs[4]. As with any other technological application, the increased usage of e-resources will depend on user acceptance and adaptation. Therefore, it is important to investigate the factors affecting the use of e-resources for learning and research activities in universities. Therefore, the present study used the concept of CSF to identify the factors which affect e-resource usage of postgraduate students of University of Colombo.

Objective of the study

- To identify Critical Success Factors (CSFs) on e-resources usage by postgraduates of University of Colombo; and rank them depending on their criticality.

Literature review

New learning environments such as e-learning and e-resources based learning provides a delivery platform for university courses, thereby, causing a considerable interest in investigating the usage, user behavior, user acceptance and other factors that affect the successful use of new technology in university education. As a result, a large and growing body of literature exists on various aspects of e-resources and using e-resources in teaching and learning. Most of the previous studies used theories to describe human factors as that are unique to any sort of study while other external factors will depend on the organizational environment.

"CSF in online education" was studied by Volery and Lord [1] who identified three critical success factors in online education: technology (ease of access and navigation, interface design and level of interaction), the instructor (attitudes towards students, instructor technical competence and classroom interaction) and the previous use of technology from a student's perspective. Soong et al[5] has carried out a multiple case study on CSF for online course resources and found the critical factors that need to be considered are: human factors pertaining to the instructors; the instructors' and students' technical competency; the instructors' and students' mindset (about learning); the level of collaboration intrinsic in the course; and the level of perceived IT infrastructure and technical support.

Eom et al[6] carried out a research to investigate the determinants of students' perceived learning outcomes and satisfaction in university online education at Midwestern University in the United States. Structural Equation Modeling was applied to examine the determinants of students' satisfaction and their perceived learning outcomes. Six variables tested in the study as potential determinants of online learning are course structure, instructor feedback, self-motivation, learning style, interaction, and instructor facilitation. According to the findings and conclusions, all six factors significantly influenced student's satisfaction. Out of six factors, only two (learning styles and instructor feedback) supported the perceived learning outcomes.

A study carried by Selim[7] identified eight CSF on e-learning acceptance. Those are instructor characteristics (attitude towards and control of the technology, and teaching style), student characteristics (computer competency, interactive collaboration, and e-learning course content and design), technology (ease of access and infrastructure), and support. The most critical indicators were instructor's attitude towards interactive learning and teaching via e-learning technologies. The survey also concluded that previous student experience with personal computers came as the most critical factor within the student characters. In the technological dimension, the ease of use of the course website was the most critical factor followed, by browser efficiency and screen design. Author assumed that these eight e-learning critical success factor (CSF) categories can assist universities and instructors to efficiently and effectively adopt e-learning technologies.

An investigation on user perceptions and attitudes towards learning objects was carried out by Lau and Woods[8]. This study empirically evaluated the technology acceptance model drawn from literature

on Information Systems (IS) to investigate how user beliefs and attitudes influence learning-object use among higher education learners. The findings clearly showed that an individual's attitude towards the use of the learning object is significantly influenced by the individual's perception about ease of use and usefulness. User perceptions of usefulness had an even stronger influence on attitudes than user perceptions of the learning objects' ease of use. Judged by its direct relationship to attitude and behavioral intention to use, perceived usefulness was found to be the most significant factor influencing the users' acceptance of learning objects. At the same time, behavioral intention to use the learning objects was highly related to the attitude and perceived usefulness.

As there was no particular study on Critical Success Factors on e-resources usage, the present study had to combine literature on the theories of technology acceptance to investigate psychological factors with literature on e-learning to identify other social, cultural and technological factors. There were no studies on factors effecting on e-resources usage among postgraduates of Sri Lankan universities hence this study was conducted.

Methodology

The research used a quantitative approach. The target population was 2630 postgraduates of the University of Colombo belonging to seven faculties. The study used stratified random sampling method to determine the sample. The total sample was calculated using the table for determination of sample size developed by Krejcie and Morgan[9]. The sample consisted of 302 postgraduates. Questionnaire was the main data collection method. Identification of variables was done based on the literature review and a focus group discussion. Factor identification was done using forty five variables (Appendix A). All the questions were structured and close ended on a five point Liket's scale.

Factor analysis and other tests were carried out using the SPSS (Version 13.00). The Principle Component Extraction and Varimax with Kaiser Normalization rotation methods were employed for the Factor analysis. The Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO statistics) measure of sampling adequacy were used to assess whether the data were suitable for analysis. Factor validity and reliability was expressed by Cronbach's alpha. Multiple regression analysis was carried out to determine the relationship between identified CSFs overall e-resource usage in the University of Colombo.

Analysis

Of the 302 questionnaires sent, 213 were returned with a rate of 70.53%. Two questionnaires were removed due to incompleteness. So, 211 filled in questionnaires were used for the analysis. Out of the respondents, 117 (55.45%) were females and 44.55% (94) were males while 54.50% being between 31 to 35 years of age (Table 1). Out of the respondents, 68.24% were following Masters Degree and 28.24% (61) were following post graduate diploma courses. There were six students reading for PhD (Table 1).

Factor analysis

Factor analysis was undertaken using the forty five variables. The KMO statistics showed 0.668 at a significance level of 0.000 (Table 2). The results of these two tests indicate that data were suitable for a factor analysis as KMO value was greater than 0.6 and Bartlett's Test of Sphericity was significant (chi-square =4754.267 with 990 degree of freedom at $p<0.000$). The descriptive statistics of the variables are summarised in Table 3. The initial Eigenvalue and the scree plot were investigated to determine the number of factors[10,11]. According to the initial Eigenvalue and the scree plot (Figure 1), 11 factors were identified in the factor extraction and overall the 11 factors explain 67% variance of the total variance (Table 4). In a rotation that converged in 8 iterations, out of forty five variables, forty one were loaded into eleven factors. Items Q13 related to attitudes, Q20,

Two questions, Q21 related to computer competency and Q41 related to the library support were eliminated from the factor analysis due to their less loadings. Out of eleven, nine factors showed high reliability with Chronbach's Alpha higher than 0.7 (Table 5).

As Table 6 shows, seven variables relating to infrastructure and library website were loaded into the first factor and labelled as "Technology". Further five variables relating to user "Computer competency" were loaded into the second factor. Four variables relating to "Usefulness" of e-resources were loaded as the third factor. Another four items which describe "Information literacy" were grouped into factor 4.

Table 1—Demographic data of postgraduates

Demographic Factor	Variables	Frequency	Percentage (%)
Gender	Male	94	44.55
	Female	117	55.45
Age	20 - 25	7	3.33
	26 - 30	39	18.48
	31 - 35	115	54.50
	36 - 40	37	17.53
	41 - 45	13	6.16
	46 – 50	0	0
Degree	Post Doctoral	0	0
	Doctoral	6	2.84
	Masters	144	68.24
	PG Diploma	61	28.92
	Other	0	0
Medium of the Degree program	Sinhala	28	13.27
	English	183	86.73
	Tamil	0	0

Table 2—KMO and Bartlett's Test for Postgraduates

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.668
Bartlett's Test of Sphericity	Approx. Chi-Square	4754.267
	Df	990
	Sig.	.000

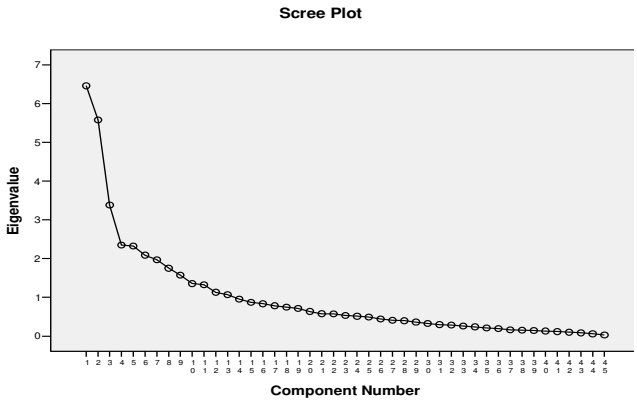

Fig. 1—Scree Plot of CSF variables of postgraduates

Three items which describe lecturer's impact were grouped into factor 5 and labelled as "Lecturers' characteristics". Another three variables relating to the attitudes of students on e-resources usage were grouped into factor six and labelled as "User attitudes". Five factors relating to "Ease of use" were loaded as factor 7. Further five items which describe "Library support" were loaded into factor 8 and titled accordingly. Finally, two factors relating to the "Accessibility" were loaded as the ninth factor.

Multiple regression analysis

These nine factors were considered as independent variables and fed into a multiple regression model to determine its relationship to e-resource usage. The regression factor scores were fed into the multiple regression model as an independent variable and usage as the dependent variable. According to the ANOVA, all the factors has a significant effect (p=.000) on e-resources usage of postgraduates. The model shows a strong linear correlation between the observed and predicted values of the dependent variable (R=.858) and higher goodness of fit

Table 3—Descriptive statistics of the variables for postgraduates

Variable	Mean	Standard Deviation	Skewness	Kurtosis
Q1. Usefulness	4.78	0.462	-1.078	1.188
Q2. Learning performance	4.70	0.542	-1.023	1.396
Q3. Learning effectiveness	4.68	0.548	-1.052	1.396
Q4. Promptness	4.72	0.483	-0.722	0.850
Q5. Ease of use	4.63	0.768	-0.978	1.545
Q6. Understandability	4.56	0.756	-.1.176	1.885
Q7. Ease of becoming skillful	4.73	0.593	-1.012	1.122
Q8 Ease of learning	4.64	0.629	-0.942	0.174
Q9. Controllability	4.70	0.653	-0.193	1.542
Q10. Wise idea	4.15	0.493	-0.912	1.092
Q11. Likeness	4.09	0.466	-0.168	1.453
Q12. Pleasantness	4.08	0.530	-0.440	1.159
Q13. Prestige	3.69	1.143	-0.440	1.008
Q14. Encouragement of searching information	4.43	0.695	-0.918	1.894
Q15. Enjoyment of using PCs	4.51	0.586	-0.097	0.597
Q16. Use of PCs for work and play	4.36	0.676	-0.879	1.457
Q17. Comfort of using computers and software	4.30	0.713	-0.428	1.150
Q18. Previous experience	4.39	0.636	-0.325	1.882
Q19. Fearlessness	4.40	0.653	-0.417	1.631
Q20. Ease of navigation	3.77	1.292	-0.269	-0.076
Q21. Having Internet access at home	3.06	1.887	0.303	-1.348
Q22. Searching ability	4.33	0.637	-1.000	1.281
Q23. Search results	4.26	0.692	-0.950	1.195
Q24.Confidence in searching	4.00	0.754	0.925	1.010
Q25. Encourage and motivate	4.34	0.834	-0.789	1.250
Q26. Ability to explain the importance	4.32	1.341	0.174	1.914
Q27. Reference lists	4.32	0.968	-0.341	1.807
Q28. On-campus access	4.21	1.311	0.287	-0.722
Q29. Ease of browsing	2.72	1.145	0.941	1.383
Q30. Browsing speed	2.65	1.250	0.959	1.635
Q31. Ease of use of the library website	3.79	0.727	0.110	0.255
Q32. Information on the website	3.89	0.722	0.172	-0.123
Q33. Availability of usernames/passwords	3.89	0.665	0.050	-0.636
Q34. Usability of computer labs	3.85	0.731	0.159	1.691
Q35. Reliability of the computer network	3.51	0.844	-0.110	0.427
Q36. IT infrastructure	3.48	0.813	-0.181	0.375
Q37. Remote access	3.87	0.849	-0.257	0.062
Q38. Technical support	3.04	0.774	0.341	0.372
Q39. Knowledgeable library staff	2.97	0.707	0.568	1.144
Q40. Supportiveness of library staff	3.01	0.734	0.464	0.606
Q41. Availability of computers	2.32	1.155	0.800	1.534
Q42. Printing facility	2.73	1.382	0.629	-0.028
Q43. Awareness	3.14	0.887	-0.018	0.214
Q44. Training/ orientation programs	2.94	0.908	0.752	1.663
Q45. Helpfulness of Librarians	3.08	0.831	0.604	0.287

Table 4—Total variance explained for CSF variables of postgraduates

		Initial Eigenvalues			Rotation sums of squared loadings		
Component		Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1		6.446	14.325	14.325	5.557	12.348	12.348
2		5.577	12.393	26.718	3.457	7.682	20.031
3		3.384	7.520	34.238	3.312	7.360	27.391
4		2.355	5.233	39.471	3.034	6.742	34.132
5		2.336	5.192	44.662	2.625	5.834	39.966
6		2.093	4.651	49.313	2.456	5.457	45.423
7	1.943	4.317	53.630	2.076	4.613	50.036	
8	1.763	3.918	57.548	2.052	4.561	54.597	
9	1.586	3.524	61.072	2.011	4.470	59.067	
10	1.369	3.042	64.114	1.930	4.289	63.356	
11	**1.349**	**2.932**	**67.045**	**1.660**	**3.690**	**67.045**	
12	.998	2.529	69.575				
13	.984	2.389	71.964				
14	.914	2.123	74.088				
15	.875	1.945	76.032				
16	.834	1.853	77.885				
17	.784	1.743	79.628				
18	.745	1.657	81.284				
19	.708	1.573	82.857				
20	.636	1.412	84.269				
21	.577	1.283	85.552				
22	.567	1.259	86.812				
23	.534	1.188	87.999				
24	.511	1.135	89.134				
25	.488	1.084	90.219				
26	.447	.993	91.212				
27	.412	.915	92.128				
28	.395	.877	93.005				
29	.363	.807	93.812				
30	.325	.722	94.534				
31	.300	.666	95.200				
32	.285	.634	95.834				
33	.259	.575	96.408				
34	.239	.531	96.939				
35	.212	.471	97.410				
36	.191	.425	97.835				
37	.162	.360	98.195				
38	.153	.339	98.534				
39	.143	.319	98.852				
40	.130	.290	99.142				
41	.115	.256	99.398				
42	.101	.225	99.623				
43	.084	.187	99.809				
44	.058	.130	99.939				
45	.027	.061	100.000				

Table 5—Total variance explained for CSF variables of postgraduates

	Component										
	1	2	3	4	5	6	7	8	9	10	11
Q33	.891	-.066	-.018	-.004	.090	-.101	-.033	.051	.148	-.088	.081
Q34	.851	-.122	-.081	-.028	.047	-.118	-.024	.046	.162	-.126	.106
Q31	.819	-.103	.025	.016	.092	.017	.007	-.046	.044	-.079	-.003
Q32	.807	-.094	-.055	.007	-.009	.012	.014	.008	.168	-.117	-.092
Q37	.767	.177	-.081	-.066	-.052	.041	.041	.178	-.289	.100	-.176
Q35	.648	.214	-.050	-.066	.014	.052	.047	.206	-.299	.089	-.249
Q36	.633	.053	-.128	-.084	-.135	.065	-.007	.333	-.401	.070	-.150
Q41	.487	.070	-.187	-.081	-.206	.041	.093	.485	-.188	.055	-.201
Q20	.444	.080	.062	-.031	-.234	-.041	.063	-.071	.359	-.031	.248
Q21	.402	-.008	-.048	.309	-.102	.075	.057	.207	-.232	.116	-.227
Q19	.014	.856	.024	.088	.015	.009	-.075	-.022	.081	.069	.055
Q18	-.016	.788	.008	.125	.100	.087	-.060	.130	-.126	-.031	.041
Q17	-.069	.785	.126	.192	-.009	.008	-.054	-.005	.080	-.143	.197
Q16	-.097	.737	.156	.183	.010	.244	.047	-.092	-.137	.038	.043
Q15	.140	.617	-.144	.436	.031	.200	.092	.062	.177	-.152	-.091
Q3	-.093	.040	.818	.179	.296	.022	.005	.008	-.031	-.003	.059
Q2	.004	-.018	.815	.253	.174	.124	.016	.071	.001	-.010	.081
Q1	-.012	.031	.809	.058	-.037	.157	.134	-.009	-.034	.006	-.113
Q4	-.166	.149	.786	.008	.087	.049	.026	.080	.049	.027	.048
Q24	-.071	.114	.095	.820	.024	.043	-.036	.094	-.014	.045	.048
Q22	-.043	.244	.141	.815	.043	.032	.035	.009	.048	.057	.176
Q23	-.147	.197	.242	.780	.105	.034	-.008	.059	-.172	.079	.148
Q14	.271	.356	.078	.653	.121	.140	.174	-.044	.124	-.040	-.070
Q25	.006	.058	.133	.055	.877	.023	.039	-.050	-.074	.038	-.083
Q27	.036	.080	.238	.024	.853	.069	.001	.051	-.091	.103	-.016
Q26	-.061	.004	.051	.104	.831	-.045	.101	.048	-.019	.130	-.088
Q11	-.030	.116	.154	.018	.011	.831	-.113	.060	-.065	-.004	.038
Q12	-.120	.107	.093	.051	.015	.799	-.123	.028	.049	.123	.070
Q10	.067	.054	.094	.075	.019	.764	-.022	-.178	.088	.048	-.130
Q13	.063	.139	-.057	.100	-.006	.498	.322	.162	-.108	-.041	.242
Q8	.003	-.052	-.041	.042	.075	-.119	.686	-.052	.025	-.102	.034
Q9	-.024	-.090	-.149	.131	-.008	.077	.660	.118	.016	-.040	.275
Q7	-.100	-.078	.287	.068	.014	-.098	.577	.197	.223	-.037	-.282
Q6	.170	.042	.259	-.087	.058	-.031	.541	-.115	-.133	.016	-.043
Q5	.010	.090	.242	-.132	.006	-.010	.517	-.332	-.173	.336	-.112
Q38	.160	.009	.103	.110	-.038	.054	-.048	.790	.051	.113	-.005
Q39	.164	.036	.088	.046	.139	-.084	-.003	.698	-.058	.081	.055
Q42	.065	.053	-.118	.015	-.092	-.050	-.032	.738	.138	.145	-.256
Q45	-.136	.075	.148	.012	-.115	.109	-.096	.541	.041	.447	-.040
Q43	.214	-.166	-.042	-.158	-.139	.099	.108	.503	.003	-.160	.294
Q29	-.011	-.092	-.109	.053	.087	.003	-.083	.060	.767	.321	.021
Q30	-.052	-.040	.094	.005	.112	.040	-.011	.062	.650	.016	-.037
Q28	-.053	.017	-.027	.065	.055	.067	.036	.037	.055	.556	.309
Q40	-.029	.162	-.101	.133	-.161	.017	-.006	-.095	-.100	.128	.611
Q44	-.217	.112	.184	.117	-.052	.041	.069	.125	-.010	.074	.576
Cronbach's Alpha	0.838	0.866	0.874	0.860	0.877	0.794	0.702	0.751	0.714	-	0.412

Table 6—Critical success factors of postgraduates

Factors	No. of variables	Cronbach's Alpha
Factor 1 Technology	Q33. Usernames/Passwords Q34. Usability of labs Q31. Ease of use of website Q32. Library website information Q37. Remote access Q35. Reliability of computer network Q36. IT infrastructure	0.838
Factor 2 Computer competency	Q19. Fearlessness Q18. Previous experience Q17. Comfort of using PCs and software Q16. Use PCs for work and play Q15. Enjoyment of using PCs	0.866
Factor 3 Usefulness	Q3. Learning effectiveness Q2. Learning performance Q1. Usefulness Q4. Promptness	0.874
Factor 4 Information Literacy	Q24.Confidence in searching information Q22. Ability of searching Q23. Search results Q14. Encouragement of searching information	0.860
Factor 5 Lecturers' characteristics	Q25. Encourage and motivate Q27. Reference lists Q26. Ability to explain	0.877
Factor 6 User Attitudes	Q11. Likeability Q12. Pleasantness Q10. Wise idea	0.794
Factor 7 Ease of use	Q8. Ease of learn Q5. Ease of use Q9. Controllability Q6. Understandability Q7. Easy of becoming skillful	0.702
Factor 8 Library support	Q38. Technical support Q39. Knowledge of Library Staff Q42. Printing facility Q45. Helpfulness of Librarians Q43. Awareness	0.751
Factor 9 Accessibility	Q29. Ease of browsing Q30. Browsing speed	0.714

(Adjusted R^2 =.722) Also the entire dimensions explain 73.6% of total variance of e-resources usage which indicates that the model fits the data well. Table 7 summarises the independent contribution of each independent variable to the prediction of the dependent variable. As Table 7 indicated, factors 1 which relates to the technology, has positive influence with highest beta-coefficient (beta=0.776) and result was significant (p=0.000). Also factors 2, 3, 4, 6 and 8 has positive impact with significant results (p<0.05=0.000). Factor 5 (Lecturer characteristics) (beta=0.057) and factor 7 (Ease of use) (beta=0.053) have a positive influence, but the results were not significant (p>0.05=0.154; p>0.05=0.185).

Accessibility has a negative impact on e-resource usage and result was not significant (p>0.05=0.408). The factors with positive influence and with significant results can be ranked according to their beta coefficients as below,

1. Factor 1 - Technology
2. Factor 8 - Library support
3. Factor 4- Information literacy
4. Factor 2 - Computer competency
5. Factor 3 - Usefulness
6. Factor 6 - User attitudes

Since multiple regression was conducted based on the normality assumption, it was checked by the histogram and normal probability plot of residuals. The normal P-P plot of residuals followed 45 degrees line which indicates the normal distribution of residuals and the bell shaped histogram approximate the normal distribution.

Discussion

Results of the study revealed that Technology was the most critical factor of postgraduates at the University of Colombo. This factor comprised of seven variables related to library website, IT infrastructure and remote access. Since most of the postgraduates use e-resources remotely, information on library website, the availability of usernames and passwords and remote access might be an advantage as they perceived technology as the most important CSF. Previous research has also found that usability of the library web interface was one of the factors which influenced e-resources usage[12]. Moreover, postgraduates are self learners so that instructions and information in the library website may help them in using e-resources. The view of postgraduate students suggested that library support was the second CSF to encourage e-resources usage. Most of the coordinators of postgraduate courses in the University of Colombo arrange training sessions with the collaboration of the librarians on using e-resources for their students. Due to this reason, the majority of postgraduates are familiar with the library staff and get their assistance in using e-resources. Information literacy was the third important factor. As McDowell[13] stated, information literacy is critical in e-resources usage and needs to be developed taking into account the growing opportunities presented by electronic information and set within the context of learning, therefore, information literacy is an important factor for obtaining maximum use from e-resources. As all computer based education systems, e-resource based learning also requires computer knowledge for getting desired outcomes. According to the perceptions of postgraduates, Usefulness and user attitudes were also positive influences for e-resources usage.

Table 7—Results of Multiple Regression Analysis for CSF of Postgraduates

Factor	Unstandardised Coefficients		Standardised Coefficients	t
	B[#]	Stand. Error	B[#]	
(Constant)	3.910	0.030		129.979
1. Technology	0.590	0.030	0.776***	19.574
2. Computer competency	0.108	0.030	0.141***	3.570
3. Usefulness	0.065	0.030	0.086*	2.167
4. Information literacy	0.25	0.030	0.165***	4.159
5. Lecturers' influence	0.043	0.030	0.057	1.431
6. User Attitudes	0.033	0.030	0.044*	1.110
7. Ease of use	0.040	0.030	0.053	1.332
8. Library support	0.203	0.030	0.266***	6.715
9. Accessibility	-0.025	0.030	-0.033	-0.830

**P<0.05*
***P<0.01*
****P<0.001*
[#]*= Beta coefficient*

Conclusion

The study identified nine reliable factors which influence on e-resource usage of postgraduate students in the University of Colombo. Out of nine factors six were positively influencing the e-resource usage. According to them, "Technology" is the most critical factor in using e-resources in the university followed by library support, information literacy, computer competency, usefulness, and user attitudes. The study concluded that teachers' influence, ease of use and accessibility are not significant in using e-resources. This indicates that priority should be given to develop IT infrastructure, to improve IT and computer skills among students and to update the library staff with technology advancements.

Since technology plays an important role in e-resources usage, university administration should plan to develop high speed internet connections as well as wireless internet access in selected study areas. The library can promote e-resources usage via its website by updating the website regularly in order to provide current information. Further, library staff can be trained constantly in order to update their knowledge on new information media.

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Appendix A

Dimension	Variables	Description
Perceived Usefulness	Q1. Usefulness	Usefulness of e-resource in learning
	Q2. Learning performance	E-Resources increase learning performance
	Q3. Learning effectiveness	E-Resources increase learning effectiveness
	Q4. Promptness	Promptness of e-resources than conventional information sources
Perceived Ease of Use	Q5. Ease of use	Ease of use of e-resources
	Q6. Understandability	Understandability of interaction with e-resources
	Q7. Ease of becoming skillful	Ease of becoming skilful in using
	Q8 Ease of learning	Ease of learning to use
	Q9. Controllability	Controllability of e-resource
Attitudes	Q10. Wise idea	Using e-resource is a wise idea
	Q11. Likeability	Likeability of the idea of using e-resource
	Q12. Pleasantness	Pleasantness of using
	Q13. Prestige	Prestige of using
User Computer Competency	Q14. Encouragement of searching information	Encouragement of searching more information than traditional resources
	Q15. Enjoyment of using PC	Enjoyment of using personal computers
	Q16. Use of PCs for work and play	Use of personal computers for work and play
	Q17. Comfort of using computers and software	Comfort of using computers and software before using e-resources
	Q18. Previous experience	Helpfulness of previous experience
	Q19. Fearlessness	Not afraid of using e-resources
	Q20. Ease of navigation	Ease of navigation through e-resources
	Q21. Having Internet access at home	Internet Access at home
	Q22. Searching ability	
	Q23. Search results	Ability to search information in e-resources
	Q24.Confidence in searching information	Satisfaction of Search results
		Confidence in searching information using e-resources
Lecturer Characteristics	Q25. Encourage and motivate	Lecturers encourage and motivate to use e-resources
	Q26. Ability to explain the importance	Ability of the lecturer to explain the importance
	Q27. Reference lists	Providence of reference lists
Technology	Q28. On-Campus access	Ease of On-Campus access
	Q29. Ease of browsing	Ease of browsing e-resources
	Q30. Browsing speed	Satisfaction of browsing speed
	Q31. Ease of use of the library website	Ease of use of the library website
	Q32. Information on the website	
	Q33. Availability of usernames/passwords	Helpfulness of the information on the library website in using e-resources
	Q34. Usability of computer labs	Availability of username/password through intranet
	Q35. Reliability of the computer network	Usability of computers in laboratory to access e-resources
	Q36. IT infrastructure	Reliability of the computer network in the University
		Efficiency of University IT infrastructure
University Support	Q37. Remote access	Ability access e-resources remotely
	Q38. Technical support	Technical support from library staff
	Q39. Knowledgeable library staff	Knowledge of library staff about e-resources
	Q40. Supportiveness of library staff	Supportiveness of library staff for e-resource users
	Q41. Availability of computers	Availability of enough computers
	Q42. Printing facility	Availability of printing facility
	Q43. Awareness	Awareness about available resources
	Q44. Training/ orientation programs	Helpfulness of Training/ orientation programs
	Q45. Helpfulness of Librarians	Helpfulness of Librarians in using e-resources