Factors contribute to the usage of library electronic information resources (EIR) by university students in Sri Lanka

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ABSTRACT

The efficacy of student use of university library e-sources relies on computer experience, ICT self-efficacy, library support, Information Communication Technology (ICT) training, obstacles in EIR use, ICT stress, training needs, infrastructure and usage of e-journals. The present study investigates the possibility of employing the Classification and Regression Tree analysis (CART) to explore the present status of the EIR usage and to find out the factors that affect use of EIR in Sri Lankan university libraries. The objectives were to identify universities according to the levels of usage of library EIR, identify the factors of EIR use in the university libraries and possibility of predicting the status of EIR usage of libraries based on CART. The piloted, validated and structured questionnaire was administered to 840 undergraduates. The CART was developed to model the EIR usage patterns and to identify the factors of the EIR usage. Based on the variable importance of CART, ICT obstacles and training requirement were recognized as most important factors. The CART indicated that 42.5% essentially need training to improve the searching level of EIR and 56.7% had no proper training in EIR and become ineffective users. These findings suggest the university libraries must prioritized the improvement of ICT facilities and identify the new ICT trends in libraries.

Keywords: Library; EIR Usage Factors; University Students; Regression Tree Modeling; Sri Lanka

INTRODUCTION

Spectacular advancements in ICT and its inculcation into almost all spheres including all types of libraries demand advanced level computer skills among individuals. According to the main objectives of the universities, the libraries also support teaching, learning and research by providing necessary information for their users. The advancement of computers and Internet provide flexibility, speed and accuracy of retrieving information with the expansion of these ICTs in the sphere. These inspiring technological advancements have opened new perspectives for information creation, duplication, storage, access, dissemination and presentation. Without adequate computing skills and knowledge, each person would feel an alien in that particular society where the technological advancement has taken place in a great manner.

The swiftness at which information sources are being produced and convert into electronic forms is awe-inspiring. To access these technologies the users must be competent or self-efficacious. The self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to produce given attainments (Bandura 1997). Further, Bandura defines self-efficacy as; "People's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura 1986, p. 391).

Although the libraries have been fulfilling the information needs of users in a traditional way, last two decades have brought a revolutionary change in university library services. Modern ICTs has had a profound demand and impact on the ways in which information is stored and accessed (Tahir, Mahmood and Shafique 2010). With this technological infrastructure and the technology revolution have given a birth to access EIR.

The main objectives of this study were to:
1. classify the university libraries based on the EIR usage.
2. identify the most affecting factors to use of EIR in university libraries.
3. predict the performance of EIR usage efficacy in university libraries.

LITERATURE REVIEW

EIR, or e-resources, can be explained as resources whose content is not limited to printed resources, and they can provide access to information that might otherwise be restricted to users due to their geographical location or financial situation. EIR are defined in various ways. For example,

> "EIR are information that is stored in a computer-readable format and that can only be retrieved through computer systems and other related technologies". (Aderibidge and Ajiboye 2013, p.248)

Using this information is a key issue in the information age, and the real challenge of the academic library is not so much the acquisition of information resources, but rather getting users to access it. Thus, development and growth in electronic publishing have created a need for new users' skills in searching full-text and, in some cases, multimedia- and hypermedia-based electronic resources.

Tahir, Mahmood, and Shafique (2010) argued that humanities students are generally reluctant to conduct literature searches in EIR because they often involve intangible or vague topics, which are difficult to express in concise language or indexing terms. Further they mentioned that training on ICT, lack of time to conduct searches, lack of training to use EIR products, lack of computer hardware and software, lack of support, and language barrier were the affecting factors to use EIR in the libraries. In supporting to that Damayanthi and Seneviratne (2008) conducted a study at two university libraries, the University of Peradeniya library network and the University of Moratuwa library, and discovered that more than 50% of students at both universities agreed with the following statements: 'Do not trust information on the Internet', 'Satisfied with information needs met by printed resources only', 'Do not deal with new technology and

have problems with the language, as English is the medium of most electronic resources'. They revealed that both universities students' poor knowledge of English affects their use of electronic resources in the library. Gunasekera (2010) studied the use of library resources at the University of Peradeniya's main library and revealed that more emphasis is needed to promote awareness and use of EIR among students due to their lack of use. Moreover, Jayasuriya (2008) found that lack of skills, lack of confidence, and lack of knowledge regarding information-seeking and evaluative skills are some barriers to effective use of ICT. In addition to these, lack of equipment, unavailability of current and relevant EIR which suit to the users information needs, limited access and no full-text for all journals, inadequate publicity and lack of awareness programme were affecting to use EIR (Peiris & Peries, 2012).

Miyanda, (2011) identified that the factors believed to be contributing towards the low usage levels of EIR were lack of encouragement and proper guidance from lecturers and librarians to students to effectively use EIRs; lack of effective internet searching skills by students to effectively exploit EIRs; fewer computers made available for the students to use ; poor internet connectivity such as internet corruption, power failure and insufficient bandwidth; and lack of awareness of the available EIRs.

However, Omekwu (2010) suggested that libraries offer undergraduate researchers information retrieval, IT competence, and Internet skills in the form of user education to enable them to make use of the library resources effectively. Alakpodia (2010) also reported that users should gain critical-thinking and technological skills that will allow them to find the appropriate information using a computer, hence the need for university libraries to incorporate computer literacy into their user education programs. Without effective and holistic user education, there will be barriers to accessing information, especially in an academic environment.

Moreover efficacy related studies mentioned that 'computer self-efficacy and Internet self-efficacy' as the main factors, computer experience, anxiety, library support are the critical factor that has been measured against self-efficacy. In addition to these factors, Ren (2000) discovered that self-efficacy in EIR searching became significantly higher after users attended a library orientation and that frequent use of databases also correlates with training. Chien (2012) suggested that a favourable learning environment and training courses enable users to become familiar with fundamental library operations.

All these researchers have mentioned many factors that were influenced to the use of EIR in the libraries However, the affecting factors and their impotency will be helpful to understand the Sri Lankan university library scenario in use of EIR.

RESEARCH DESIGN

The structured questionnaire-based survey method was used for data collection. Before collection the data, the questionnaire was piloted with the four Universities of Peradeniya (PDN), Sri Jayewardenepura (SJP), Ruhuna (RUH) and Rajarata (RJT) university of Sri Lanka. It was included the four efficacy scales of ICT self-efficacy, ICT

stress, ICT training and library support. In addition, the EIR related questions also included after an extensive literature review and all these were tested by using Likert method. To purify the scales the Cronbach's Alpha reliability (α) and the item-total correlation was tested in the pilot survey. The experts' opinion- senior librarians who are in the ICT units were also taken of these universities and then the questionnaire was administered to the main samples populations for data collection. The main survey study population consisted of 840 HSS final year undergraduates who are subject specializing of the four universities mentioned above. The main survey data collection was done during June-September 2013 and researcher conducted the data collection in the four universities. Stratified random sampling was used to collect the representative students from each department in chosen universities.

The questionnaire consists of the general information, four efficacy measures, EIR usage, facilities, obstacles, training needs and computer experience. Only 96 items which were selected from reliability and alpha were used for factor analysis. These 96 items were used to measure the nine factors of the questionnaire according to the four sources of self-efficacy. Out of 840 questionnaires 604 were calculated as useable number of copies and were duly completed and returned. These represent a response rate of 72 percent. Data gathered through the questionnaire were analyzed using the Statistical Package for Social Sciences (SPSS). The descriptive statistics; cross-tabulation and frequency analysis were performed on the data set. The RT model is used to explore the patterns if any in the dataset. The CART modeling is an exploratory technique based on uncovering structure in data.

It has long been recognize the importance of tree based regression in effective modeling of the relationships between items and constructs and many methods have been employed for this purpose. Trees partition a data set into regions so that within each region, observations are as homogeneous as possible in terms of the outcome (Brieman, Friedman, and Stone 1984; Shmueli and Mani 2013). This approach makes trees useful for predicting outcome values for individual observations as well as for selecting important predictor variables (Shmueli, Patel and Bruce 2010). The Classification and Regression Tree (CART) analysis has been widely used in the sociology (Berk, 2006) and even in education (Kitsantas, Kitsantas, Kitsantas 2012).

All partitions resulted by all variables are compared with the reduction in heterogeneity that they provide. In RTs the heterogeneity in a group is measured by computing mean squared error. According to Brieman, Friedman, and Stone (1984), relative mean squared errors (R (d)) is defined for a group of observed values y as,

$$R(d) = \frac{1}{N}\sum_{n}(y_n - \overline{y})^2$$

in which $\overline{y}$ is the mean value across all observations y_i.

Each partition of RT generates a left

$$R(d)_R = \frac{1}{N}\sum_{n}(y_n - \overline{y})^2$$

and right

$$R(d)_L = \frac{1}{N}\sum_{n}(y_n - \overline{y})^2$$

Mean Squared Error values where subscript L and R indicates an assignment of number of samples in branches in a partition. The partition that minimizes the change in mean square error,

$$\Delta R(d) = R(d) - R(d)_L - R(d)_R$$

is the partition to be selected. The repetitive partitioning of a large database produces a tree with a very large number of terminal nodes. For such databases, there is a possibility to loose generality of the predictive ability of such large trees, because of over-fitting the data in the model. To avoid such over-fitting, a tree has to be pruned to be useful for prediction. The RT methodology has variations regarding tree pruning (Bell 1999). One common method to access treefitting is by using developed tree to predict a new set of data. In this process, deviance is replaced by sum squared prediction error, and the best subtree in the sense of minimizing prediction error can be determined. However, holding a subset of aside for validation may be wasteful, and the tree selected depends partially on the set of data selected to be held out. Following Brieman, Friedman, and Stone (1984), it is advisable to use a form of cross-validation to imitate this kind of validation process without wasting data. The data set is randomly partitioned into ten approximately equal parts and each part is held out in turn. A sub-tree T' is then re-estimated on the remaining 90% of the data, and the re-estimated tree is used to forecast the 10% of data that was held out, assuming that $CV_i(T')$ denote the sum squared error (SSE) for the ith partition of the process. The process is repeated for all ten subsets (10-fold cross-validation) of the data, and a total cross-validation score,

$$C(T') = \sum_i CV_i(T')$$

is computed for the sub-tree. A sub-tree that minimizes the CV(T') is a satisfactory final selection for a tree that is appropriate for the data.

However, in the present study, the data were divided into two sets and one set serves as developing and training of the Regression Tree and the second was used to test the trained tree.

RESULTS

The reliability of almost all scales in questionnaire was above >0.70 (Table 1). Therefore, the scales used in the questionnaire were reliable and consistence. The Internal Consistency of the Reliability of nine scales of the study is show in Table 1. According to Compeau, Higgins, and Huff (1999) the reliability coefficient of 0.70 was considered as the significant value of the reliability of a scale.

The sample included 604 students out of which 21.7% were males and 78.3% were female. The female respondent rate was comparatively higher than the male throughout the universities. The 86.6% of the students are study in Sinhala medium, and 11.6% were studying in English medium. The Tamil medium of study represents 1.8% which was the lowest percentage in the sample (Table 2) and was available only in the University of Peradeniya.

Table 1: Reliability indices of each scale

No	Name of the Scale	Code of the Scale	Number of items retained	Reliability-Cronbach's α
1	ICT Self-efficacy Scale	**ISE**	23	0.963
2	ICT Stress Scale	**SS**	10	0.914
3	Library Support	**LS**	7	0.755
4	ICT Training	**TR**	3	0.914
	Sub-Total		**43**	
1	EIR Scale	**EIR**	23	0.910
2	Facilities and use of e-journals	**FEJ**	08	0.725
3	Obstacles to use ICT	**OU**	06	0.772
4	Training needs	**TN**	04	0.879
5	Computer experience	**CE**	02	0.772
	Sub-Total		**43**	
	Grand Total		**96**	

Table 2: Demographic details of the respondents

Demographic variable		University				
		PDN	**SJP**	**RUH**	**RJT**	**Total**
Gender	Female	168 (35.5%)	174 (36.8%)	76 (16.1%)	55 (11.6%)	**473 (78.3%)**
	Male	44 (33.6%)	39(29.8%)	43 (32.8%)	5 (3.8%)	**131 (21.7%)**
Medium of Study	Sinhala	171 (32.7%)	211(40.3%)	119 (22.8%)	22 (4.2%)	**523 (86.6%)**
	English	30 (42.9%)	2 (2.9%)	0 (.0%)	38 (54.3%)	**70 (11.6%)**
	Tamil	11 (100.0%)	0 (.0%)	0 (.0%)	0 (.0%)	**11 (1.8%)**

The RT models were developed to measure the EIR usage efficacy and to find out the affecting factors of the universities included in this study. The models were developed by dividing the data into 'training' and 'testing' samples. During the 'training' a model was developed and was tested by the 'testing' samples. A dendrogrammes were produced for training (Figure 1) and testing (Figure 2) for classification. According to Figure 1 the training sample was split into 7 terminal nodes. The first parental node of the tree was split by "ICT training" and forms two child nodes (1 & 2) which were further split by "EIR usage" into two child nodes and two terminal nodes (4 & 5). The terminal node 4 include most of the cases from the University of Peradeniya (59.7%) meanwhile the terminal node 5 include the higher number of percentage of cases (62.1%) from University of Sri Jayewardenepura. The left most branch of the tree further split by "Obstacles to use EIR" to produce the terminal node (7) and a child node (Node 8). The terminal node 7 includes the higher percentage of (94.1) from University of Ruhuna. The

child node 8 further split into two terminal nodes by "Training Needs". The terminal node 11 represented a higher portion of cases from University of Ruhuna (68%) and the terminal node 12 was represented more or less equal case percentage from University of Peradeniya (38.6%) and Sri Jayewardenepura (33.3%). Child node 6 of the right branch of the tree split by "Obstacles to use EIR" into two terminal nodes i.e. node 9 and 10. The composition of the node 9 indicate that the higher percentage of cases were from the University of Peradeniya (62.3%) meanwhile the terminal node 10 included higher percentage of (48) cases from Sri Jayewardenepura University and 32% of cases from Rajarata University of Sri Lanka. The RT developed by test sample is shown in Figure 2. Comparison of 'training' and 'testing' models clearly indicate that the trend of classifying cases into terminal nodes is more or less similar. Further, the values of estimate risk of 'training' and 'testing' models were 0.409 (S.E. 0.022) and 0.518 (S.E. 0.030) respectively.
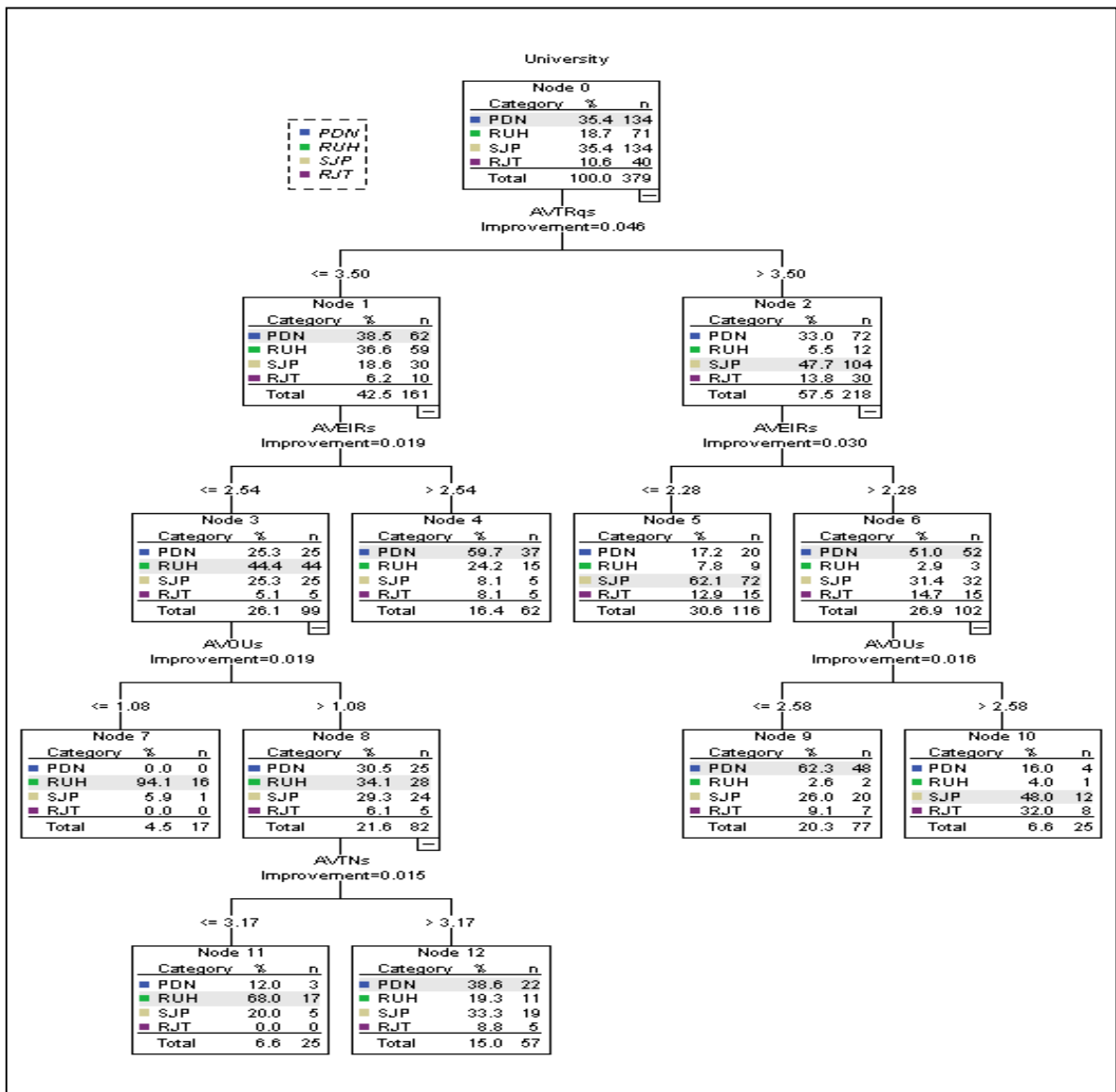

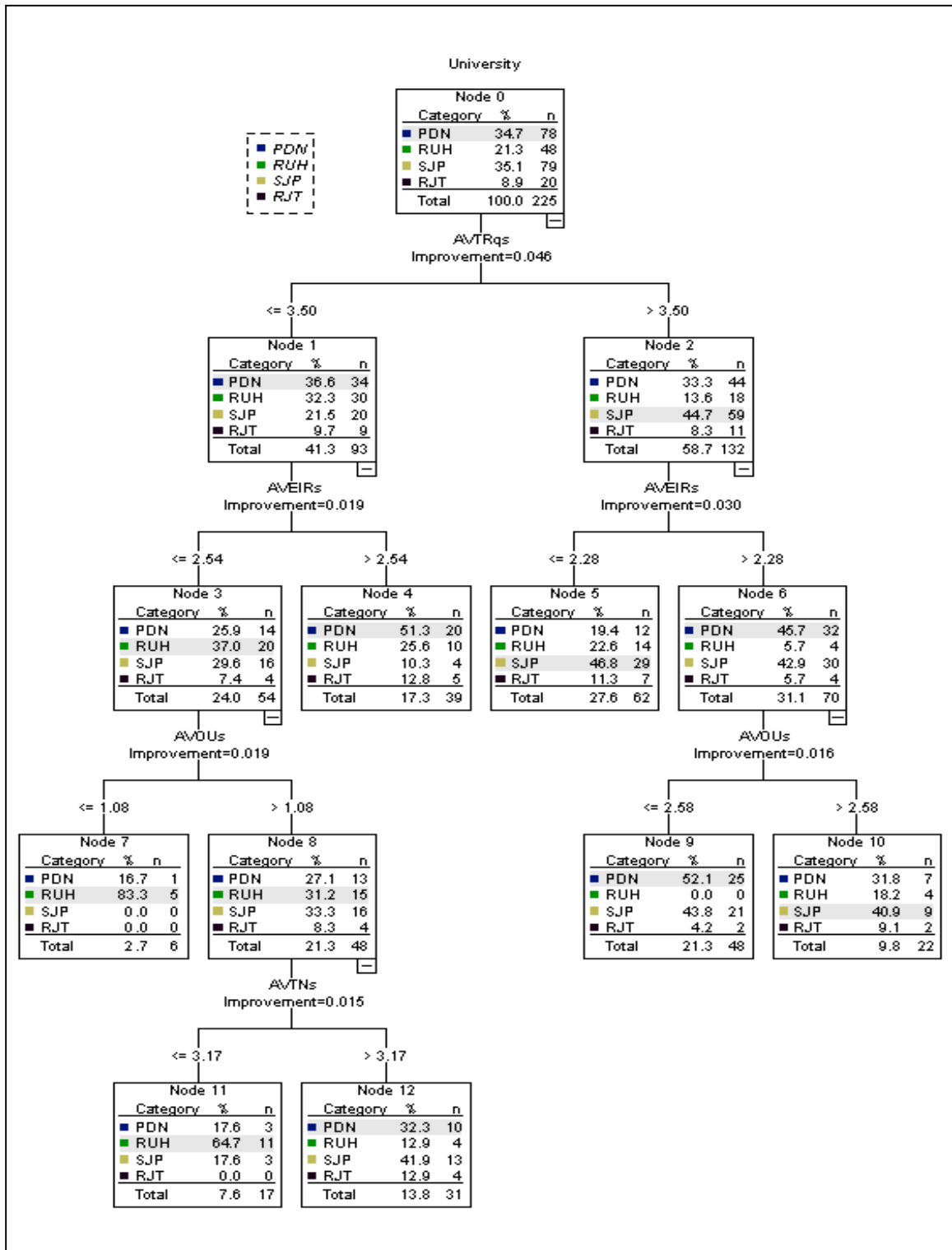Figure 1: Regression tree developed for training set of data

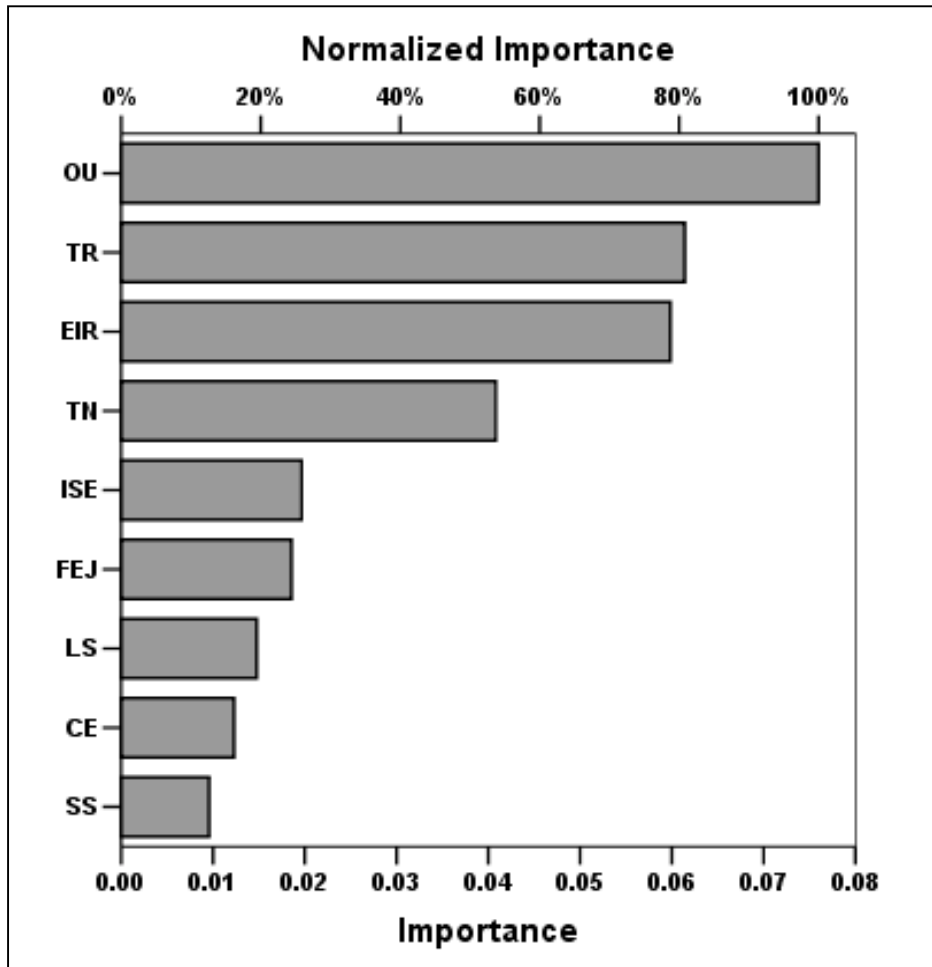Figure 2: Regression Tree resulted from the test data

Figure 3: Factor importance of the developed Regression Tree

The most affecting factors in the RT model is shown in Figure 3. The "Obstacles to use EIR" (OU) was the most important variable that governs the efficient use of EIR and subsequently the factors "ICT Training" (TN), "Electronic Information Resources" (EIR) plays a more or less similar role in the usage of EIR (Figure 3). The contribution of the rest of the factors in the model was range 12.6% – 25.9%.

The training and testing results of CART model is given Table 00. The percentage of correctly classified for training and testing indicated that students' usage of EIR of Universities of Peradeniya and Sri Jayewardenepura were predicted satisfactorily (80% and 63%). Meanwhile, EIR usage of other two universities was poorly predicted (47% and 0%). Similarly, the predictive performance of test sample also indicated the more or less similar classification performance for Jayewardenepura and average performance for the rest of the universities except RJT.

In summary, the following results were obtained from the RT analysis of the data: a). Reduction of the number of factors in the data set to four (09) factors of EIR usage, b). Verifying RT application in identifying the different levels of efficacy in EIR usage and

prediction of EIR efficacy across the Sri Lankan universities and c). Identifying RT as a tool for conserve the time, labor, cost, and energy by reducing larger number of factors into manageable number of factors in the data set.

Table 3: Confusion matrix of predictive performance developed CART for students' usage of EIR

Classification Table						
		Predicted				
Sample	Observed	PDN	RJT	RUH	SJP	Percent Correct
Training	PDN	107	0	3	24	79.9%
	RJT	17	0	0	23	.0%
	RUH	28	0	33	10	46.5%
	SJP	44	0	6	84	62.7%
Overall Percentage		51.7%	.0%	11.1%	37.2%	59.1%
Test	PDN	55	0	4	19	70.5%
	RJT	11	0	0	9	.0%
	RUH	14	0	16	18	33.3%
	SJP	38	0	3	38	48.1%
Overall Percentage		52.4%	.0%	10.2%	37.3%	48.4%
Growing Method: CRT						
Dependent Variable: University						

DISCUSSION

There is a rapid expansion of use of EIRs due to the recent development in the computer and communication technology. These spectacular developments in information technology (IT) may have a considerable impact on information users in Sri Lankan university libraries. Further, these advancements of IT and its inculcation into almost all spheres demand an advanced level of computing skills among individuals. This conversion required the knowledge in advance technology and associated infrastructure. Comparatively the developed countries have reached their higher status in use of EIR because they have developed their technology with associated infrastructure.

As a developing country Sri Lanka has adopted the ICT for the higher educational institutes for the purposes of students' benefits. The successful use of these facilities could be depending on the status of the available services, including infrastructure and the capacity of user to use the service. The most popular method of searching EIR is keyword followed by author and subject. But a large number of Electronic Information Service users are not satisfied with the infrastructure facility available in the library. Therefore, how to help students to help themselves in learning and retaining the basic skills is becoming one of the major challenges for academic libraries (Ren 2000) with inadequate infrastructure facilities. The availability of computers with higher

performance and other facilities such as provision of Internet and relevant EIR should be provided to these libraries.

The result of the study indicated that CART modeling could be used for larger dataset obtained from surveys which were difficult to handle with conventional statistical analytical procedures. The models can be used to reduce the redundancy in the data set and at the same time retain the important factors for further analysis. The higher normalized importance value of ICT training factor indicated that it contributes significantly to the EIR usage. It has been suggested that an effective training program will increase the understanding of the functionality of the e-learning system. Relating to this study only three training items, OPAC training, provision of printed guides and training on how to do searches are the highly request areas and the leaning of EIR self-efficacy (Chien 2012). The use of EIR would increase if these areas of training were concerned with hands on practices. Moreover, Techatassanasoontorn and Tanvisuth (2008) mentioned that ICT skill training increases self-efficacy which in turn influences ICT acceptance. ICT Training is second influential higher factor in the study, which also positively prop ups to improve EIR usage. Therefore, ICT training is required to increase the use of EIR by the undergraduates. From the theoretical perspective training lead to successfully perform specific tasks. In the same way the undergraduates have agreed and showed that the ICT training is necessary for efficient use the EIR in the library. The RT model represents that out of the total sample (42.5%) essentially need ICT training to improve the searching level of EIR. Use of EIR and services was influenced by a number of factors as the computing skills of users, and therefore, adequate emphasis should be given to develop the basic computing skills among library users through user education programs. All the libraries practiced at least one awareness programme such as library orientation programme to popularize ICT and EIR services and resources in these libraries. Further, the above finding is supported by Jayasundara (2009) who identified that promptness of staff, supportive atmosphere, staff knowledge, help to improve supportiveness in the library and also library guides helpful to improve the service quality of the libraries.

The training needs also significant in this study the undergraduates indicated that they prefer to have brochure/ leaflets/ or guiding materials to learn about the use of EIR. Ren (2000) mentioned that properly designed library instruction is more likely to help students dispel apprehensions related to EIR searching and increase their self-efficacy.

The "Obstacles to use EIR" is the highest influencing factor. The availability of computers providing the opportunity to ensure that students are provides the opportunity to master the finding information and know-how of performing searches. However, all the universities indicated that they are highly suffering with obstacles to use EIR which indicating 100% in the Figure 3 of the RT model.

CONCLUSIONS AND RECOMMENDATIONS

The self-efficacy concerned in the present study include nine factors such as computer experience, ICT self-efficacy, Library support, ICT training, obstacles to use EIR, ICT

stress, EIR use, Training needs, and facilities and use of e-journals as the factors which may affected the use of EIR in the university libraries.

In the present study, an approach was made to employ the Classification and Regression Tree analysis (CART) to trace the contributive factors of students' EIR usage of Sri Lankan universities. Findings of CART analysis suggest that it is more useful in studies related to students' EIR usage in university libraries specially Humanities and Social Sciences faculties. In addition, it helps academic librarians to identify the factors of effective usage of EIR by students through gathering a large dataset and use these factors to make decisions in individual universities to improve the identified factors through the study.

The university libraries must give priority to ICT facilities if they are to continue timely services to their user community. Attempts to make to identify the new ICT trends in libraries, especially accessibility to the digital library and for other databases are recommended for provision of effective and efficient library services. To overcome these circumstances, the provision of OPACs, Internet, Email services and other EIR services should at all service points and the provision of adequate equipment to access those are vitally imperative for all kinds of users and researchers in the library (Ani, Jacob, and Nkoyo, 2005 and Ramazan, 2004) as no library can function properly without an e-mail and Internet connection in this information driven society. Implementation of electronic circulation will also increase the use of EIR and bring more and accurate information through library software in the university libraries. It is vital to have mandatory hands on training course on the use of EIR for students' better academic performances. Well planned ICT focused orientation programmes are necessary for undergraduates to have awareness of the EIRs in the library and it should be a continuing programme. Further, the specific time allocation for students would be effective with the assessment of their outcomes after the following the training course. The library guides should provide in three languages to minimize the gaps of language barriers of the users. For the library staff, short term regular training courses or workshops conducted and knowledge on work skills needs to be upgraded. As the students are more concerned about the basic skills of computer training, the faculties and the relevant higher authorities of the universities offer more ICT centered information training through all academic years. Alternatively, training methods such as through broachers, discussions, small group training upon request and uploading of user guides on use of EIR to the each university web page could be recommended.

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REFERENCES

Aderibigbe, N. A. and Ajiboye, B. A. 2013. User education program as determinant of electronic information resource usage in Nimbe Adedipe University Library, Nigeria. *The Electronic Library,* 31(2),244-255.

Alakpodia, O. N. 2010. Assessment of information literacy skills among librarians in Delta State University, Abraka. *The Information Technologies,* 7(1), 55-63.

Ani, Okon E. Jacob, E. Esin, and Edem, Nkoyo. 2005. Adoption of information and communication technology (ICT) in academic libraries: A strategy for library networking in Nigeria. *The Electronic Library,* 23 (6), 701-708.

Bandura, A. 1986. *Self-efficacy, social foundations of thought and action: a social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. 1997. *Self-efficacy: the exercise of control.* New York: W. H. Freeman & Company.

Bell, J. F. 1999. Tree-Based Models*.* In Fielding, H. (ed.) *Machine Learning Methods for Ecological Applications,* Kluwer Academics Publication, Boston, Massachusetts: USA.

Berk, R. A. 2006. An Introduction to Ensemble Methods for Data Analysis. *Sociological Methods & Research,* 34 (3), 263-295.

Brieman, L. J., Friedman, R. O., and C. Stone, 1984. *Classification and Regression Trees.* Chapman & Hall: London.

Chien, T. C. 2012. Computer self-efficacy and factors influencing e-learning effectiveness. *European Journal of Training and Development,* 36 (7), 670-686.

Compeau, D., Christopher A. H. and Huff, S. 1999. Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly,* 23(2),145-158.

Damayanthi, K. P. N. and Senevirathne, T. M. 2008. Print Vs. Electronic: User Preferences for information Resources: A Comparative Study. *National Conference on Library and Information Studies (NACLIS) 24 June 2008,* Colombo. Sri Lanka Foundation Institute. CD-ROM.

Gunasekera, C. (2010). Students usage of an academic library: A user survey conducted at the Main Library University of Peradeniya. *Journal of the University Librarians Association of Sri Lanka,* 14, 43-60.

Jayasundara, C. C. 2009. *Developing a model for predicting customer satisfaction in relation to service quality in university libraries in Sri Lanka.* [Unpublished Doctoral thesis], University of South Africa, 411.

Jayasuriya, S. 2008. Access to Electronic Information: Challenges and Initiatives. *Journal of the University Librarians Association of Sri Lanka,* Vol. 12: 85-106.

Kitsantas, A., Panagiota K. and Thomas K. 2012. Assessing college student interest in math and/or computer science in a cross-national sample using classification and regression trees. *The International Education Journal: Comparative Perspectives,* 11,(2), 45–62.

Miyanda, E. M. 2011. Factors affecting utilization of electronic information resources and services by medical students at university of Zambia. [Thesis Master of Library and Information Studies] Submitted to University of Zambia. Available at: http://hdl.handle.net/123456789/171

Omekwu, C. (2010). Web resources for medical research. *Proceedings of the 2nd Professionals Summit on Technology (PSIST)*, May 2010: 463-470.

Peiris, N.D., Peiris, B. L. 2012. Use of Electronic Information Resources by postgraduate students: a case study. *Journal of the University Librarians Association*, 16 (1), 46-69.

Ramazan, M. 2004. Effects of (IT) utilization and knowledge on librarians' IT attitude. *The Electronic Library,* 22 (5), 440-447.

Ren, W. H. 2000. Library instruction and college student self-efficacy in electronic information searching. *The Journal of Academic Librarianship,* Vol.26, no.5: 323-328.

Shmueli, G., N. Patel, and P. Bruce., 2010. *Data Mining for Business intelligence: Concepts, Techniques and Applications in MS Excel with XLMiner*. Wi. 2nd ed.

Shmueli, G. and Deepa, M. 2013. *Impact assessment in observational studies: A classification and regression Tree Approach*. Available at: http://dx.doi.org/10.2139/ssrn.2276770

Tahir, M., Khalid, M. and Farzana, S. 2010. Use of electronic information resources and facilities by humanities scholars. *The Electronic Library,* Vol.28, no.1: 122-136.

Techatassanasoontorn, A. A. and Arunee, T. 2008. *The Integrated Self-Determination and Self-Efficacy Theories of ICT Training and Use: The Case of the Socio-Economically Disadvantaged*. Available at: www.globdev.org/.../23-Paper-Techat-Intergrated%20Self%20Determ.pdf