

# **2019 PROCEEDINGS OF 10<sup>TH</sup> INTERNATIONAL CONFERENCE OF UNIVERSITY LIBRARIANS ASSOCIATION OF SRI LANKA**

**Reinvigorating Libraries: Smart Responsiveness for Sustainability**

**Colombo, Sri Lanka  
18<sup>th</sup> September 2019**

# PROCEEDINGS



**10<sup>th</sup> International Conference  
of  
University Librarians Association  
of  
Sri Lanka  
(ICULA-2019)**

*Reinvigorating Libraries: Smart  
Responsiveness for Sustainability*

**18<sup>th</sup> September 2019  
Mount Lavinia Hotel  
Colombo  
Sri Lanka**

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## **International Conferences held by the University Librarians Association of Sri Lanka**

**1. “E-information for Teaching, Research and Learning: Options for a  
University Consortia”**

1<sup>st</sup> International Conference of University Librarians Association (ULA)  
of Sri Lanka, 27<sup>th</sup> and 28<sup>th</sup> May 2005 at Hotel Galadari, Colombo.

**2. “Information Best of Two worlds”**

2<sup>nd</sup> International Conference of University Librarians Association (ULA)  
of Sri Lanka, 23<sup>rd</sup> and 24<sup>th</sup> May 2006 at Hotel Galadari, Colombo.

**3. “Libraries in Higher Education: partners in K4D?”**

3<sup>rd</sup> International Conference of University Librarians Association (ULA)  
of Sri Lanka, 8<sup>th</sup> and 9<sup>th</sup> June 2007 at Hotel Galadari, Colombo.

**4. “Libraries as Centres of Excellence”**

4<sup>th</sup> International Conference of University Librarians Association (ULA)  
of Sri Lanka, 2<sup>nd</sup> and 3<sup>rd</sup> July 2008 at Hotel Galadari, Colombo.

**5. “Research for Impact (R4I)”**

5<sup>th</sup> International Conference of University Librarians Association (ULA)  
of Sri Lanka, 2<sup>nd</sup> July 2009 at Hotel Galadari, Colombo.

**6. “University Librarianship: An Academic Challenge and an  
Opportunity”**

6<sup>th</sup> International Conference of University Librarians Association (ULA)  
of Sri Lanka, ICULA 2010, 14<sup>th</sup> and 15<sup>th</sup> July 2010 at Ceylon Continental  
Hotel, Colombo.

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7. **“Contribution of the Academic Librarians Towards a Knowledge Society”**

7<sup>th</sup> International Conference of University Librarians Association (ULA) of Sri Lanka, ICULA 2011, 16<sup>th</sup> and 17<sup>th</sup> August 2011 at Hotel Galadari, Colombo.

8. **“Libraries as Partners of Knowledge Sustainability”**

8<sup>th</sup> International Conference of University Librarians Association (ULA) of Sri Lanka, ICULA 2016, 7<sup>th</sup> and 8<sup>th</sup> March 2016 at University of Jaffna. Jaffna.

9. **“Academic Libraries as Research Saturation Centers: Reshaping the Libraries for Tomorrow”**

9<sup>th</sup> International Conference of University Librarians Association (ULA) of Sri Lanka, ICULA 2018, 20<sup>th</sup> and 21<sup>st</sup> September 2018 at Golden Rose Hotel, Boralesgamuwa.

## MESSAGE FROM THE CHIEF GUEST

### HER EXCELLENCY ROBINA P. MARKS

South African High Commissioner for Sri Lanka



The 4th Industrial Revolution is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres. For university libraries to be smart, responsive and sustainable, it will have to innovate to utilize effectively the gains that can be made through embracing the 4th industrial revolution. As well, university libraries have to consider its responsibilities as being associated not only with being in the forefront in technology and research, but also with the needs and the implications for future employment and economic well-being of their users. This poses a two-fold challenge: Firstly, investing in research, development, and innovation, and secondly, embracing the digital age by modernise systems and work process. This requires us to re-imagine the future of our university libraries so that we can prepare and reskill ourselves and our users with digital literacy, and so ensure the sustainability of our libraries and the prosperity of our countries

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## MESSAGE FROM THE PRESIDENT

### **DR. C.C. JAYASUNDARA**

President, ULA  
Librarian, University of Kelaniya



As President of the University Librarians Association of Sri Lanka, I take great pride in welcoming all the authors in the proceedings of the 10th International Conference of the University Librarians Association of Sri Lanka (ICULA 2019) to be held at Mount Lavinia Hotel in Sri Lanka. In particular, I believe that ICULA 2019 will certainly build on the two key components which make it more precious - the opening to network with professional colleagues and the quality of the content. The coverage of the papers is admirable and outstanding, starting with strategic issues and cascading down to distinct areas of curriculum relevance in the field of Library and Information Sciences.

There are many conferences held each year around the world offering many scholars/researchers the prospect to publish in conference proceedings. However, due to the looming global recession, monetary constraints etc., many conferences are now quantity-driven rather than quality-driven. This should not come as any surprise as it is very expensive to hold a conference these days. As a result, it becomes apparent a decline in the quality of the conferences each year. Thus, it is crucial to carefully select a quality conference if you need to gain expected results. Attending a quality driven

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conference is an investment. However, organizing a quality driven conference like ICULA 2019 is not an easy task. Our members of ULA have put a lot of time, energy, and resources into over many years and in order to capitalize on that investment. As a result of these endeavors, attendees of ICULA over last 10 years have been benefitted a lot including power in being connected to other professionals in the industry who are active in their line of work. Also, ULA offers many benefits to its wider member community including international conferences, annual research and innovation awards, training programmes not only to the librarians but also to the para-professionals and support staff in university libraries. As we build this pioneering organization over several decades, I hope you all will passionately join us in this exciting conference so together we can reshape and create a better future for the next generation of our university libraries. I congratulate you all for your commitment and active participation and wish you all the best success.



## **MESSAGE FROM THE CO-CHAIR (OVERALL MANAGEMENT)**

**MR. W.J. JEYARAJ**

Co-Chair (Overall Management) – ICULA 2019  
Acting Librarian, Eastern University of Sri Lanka



I take much pleasure and pride in penning these words down as we take yet another leap into a milestone in the library field's academia. Driving this conference from day one to its finale has been a memorable and treasured effort of so many of us who have involved directly as well as indirectly. However, with technology blooming into never-before conceived and employed devices with unrestricted access being provided to anyone, Libraries are now at the brim of facing a challenge of diminished usage and ultimately extinction. Taking a 360-degree overview of the incremental development around the area of Information and Technology, we need to be enlightened about the isolation of tangible information sources such as books and journals from intangible e-resources. Though libraries have conventionally stood by the tangibility of information, considering the speed, ease and inclusiveness with which the competitor, that is, the tech-based information is dispersed forces libraries to reconsider their strategic plans and reformation of the library to effectively perform above par.

This winds a situation where the field of library science requires the statutes and revisions in the way that we conduct the processes within Libraries. As the use of Libraries deprecates, researchers need to evolve

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alongside technology such that incorporating innovative ideas and incentives to stroll steadily and firmly in reassuring the existence of Libraries.

Hence, we have put together this conference in hopes of gathering a rich pool of academicians, scholars, researchers, and experts in order to extract your ideas and concepts that could possibly be a solution to reinvigorate libraries among the current tech-oriented generation. The main intent of our conference is to find innovative ideas, discuss it with like-minded academicians, and publicizing valuable research contributions to a much larger target audience.

## **MESSAGE FROM THE CO-CHAIR (PUBLICATIONS)**

### **MR. C.N.D. PUNCHIHEWA**

Co-Chair (Publications) – ICULA 2019  
Senior Assistant Librarian, University of Moratuwa



I am honored and privileged to present this message as the Co-Chair (Publication) of the 10<sup>th</sup> International Conference of University Librarians Association of Sri Lanka (ICULA) – 2019, held on the theme of “Reinvigorating Libraries: Smart Responsiveness for Sustainability”. ICULA is one of the main annual event of research dissemination among the Library and Information Science (LIS) professionals in the country.

ICULA serves as an International forum for researchers and practitioners in the field of LIS in Sri Lanka to exchange their knowledge and experience with the International LIS professionals to redesign the university libraries to fulfill the needs of modern technical era.

Providing a great platform to deliver and exchange the knowledge and experience in all aspects of Library and Information Science, the conference is held with seven sub themes; LIS Education and Research, Next Generation Information Retrieval, Documentation of Cultural Heritage, Librarianship and Social Networking, Citation Metrics, Marketing Libraries and Innovative Practices in Library Sector. ICULA – 2019 will facilitate thirteen oral presentations in three sessions including three full-text papers and ten extended abstracts.

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Planning and organizing of this kind of International Conference would be impossible without proper leadership and teamwork. I would like to express my sincere thanks to the president of University Librarians Association of Sri Lanka for the excellent leadership provided and all the members of conference committee of ICULA-2019 for their untiring support in planning and execution of the conference events.

I am immensely grateful to all the reviewers and language editors of ICULA- 2019, on behalf of the conference organizing committee for their expert knowledge and time committed for this event without any financial or other benefits.

Finally, I would like to congratulate all the authors and co-authors who submitted papers for this conference and also my heartfelt gratitude is expressed to the chief guest, keynote speakers, invitees, participants and the sponsors of ICULA-2019 for making this event a success.

## CITATION OF KEYNOTE SPEAKER

### **PROF. SUSIRITH MENDIS**

*Senior Professor of Physiology*

Director, Medical Education

Faculty of Medicine

General Sir John Kothalawala Defence University

Sri Lanka



Prof. Susirith Mendis, currently a Senior Professor of Physiology and the Director, Medical Education in the Faculty of Medicine, General John Kotelawala Defence University, Sri Lanka has a near 40-years of experience in the university medical field.

Prof. Mendis was the Vice Chancellor of the University of Ruhuna (2007-2013), the Dean of the Faculty of Medicine (1996-2005) at the same University. He was the Founder Director of the Staff Development Centre of the University of Ruhuna, the Deputy Vice Chancellor of the General John Kotelawala Defence University (2013-2014), Sri Lanka and the Director, CME & CPD at the Gulf Medical University, Ajman, United Arab Emirates (2014-2016).

He has been on several other professional committees of many National Organizations. He has served as the Chairman of the Committee of the Vice Chancellors and Directors (CVCD) of Sri Lanka, Chairman, Board of Management, Postgraduate Institute of Medicine (PGIM), Chairman, Ethics Committee of the Sri Lanka Association for the Advancement of Science

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(SLAAS), President and the Vice President of the Physiological Society of Sri Lanka, member Standing Committee on Medical & Dental Sciences, UGC, Board of Management of the Postgraduate Institute of Medicine, University of Colombo, National Health Research Council, Sri Lanka Medical Council, Cabinet Appointed Committee, National Health Development Committee (NHDC) of the Ministry of Health, Sri Lanka, National Education Commission, Committee for Medicine, Dental & Veterinary Sciences of the National Science Foundation (NSF), Presidential Committee on Educational Reforms, National Science & Technology Commission (NASTEC), National Council for Economic Development (NCED), and the Hambantota International Hub Development Project.

Further he has been on the International Advisory Committees as a Temporary Advisor to the WHO-SEARO at the 10<sup>th</sup> meeting of the Directors of Medical Research Councils or Analogous Bodies and Concerned Foci in the relevant ministries (MRC) in 1996 and at the Consultative Meeting on 'Health Development in South-East Asia in the 21st Century' in 1997.

Prof. Mendis has been a very significant contributor to research and development in the profession. He has presented many research papers at International Conferences, written an extensive number of research articles on Medical Education, and several other Medical Science related themes for a wide range of professional and academic scholarly journals. He has been the Co-Author of two chapters in an International Monograph published in Netherlands in collaboration with the University of Chicago, USA.

Prof. Susirith Mendis has also been awarded a Keynote Speaker in many Professional forums and has delivered five Orations to professional

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medical associations and colleges that have been of prime significance to the medical profession.

In his multiple roles as the University Senior Professor, Director, Chairman, President, Educator, Researcher, Advisor, Trainer and Leader, his influence has reached beyond the regional level, up to the national and international levels.

## CITATION OF KEYNOTE SPEAKER

### **PROF. MAITHREE WICKRAMASINGHE**

*Senior Professor of English*

Department of English

University of Kelaniya

Sri Lanka



Maithree Wickramasinghe (PhD) is a Senior Professor and Chair of the Department of English and was the founding Director of the Centre for Gender Studies at the University of Kelaniya, Sri Lanka. She is also a Visiting Professor at the Centre for Higher Education and Equity Research (CHEER), University of Sussex, United Kingdom and the Postgraduate Program on Gender and Women's Studies at the University of Colombo.

Her work spans a number of disciplines as evinced by her numerous publications including *Feminist Research Methodology – Making Meanings of Meaning Making* in 2010, and *Gender Dimensions in Disaster Management* co-authored with Madhavi Malalgoda Ariyabandhu in 2003/2005 which is translated into Urdu, Hindi, Tamil and Sinhala. Professor Wickramasinghe was an Associate Editor of the Wiley Blackwell Encyclopedia on Gender and Sexuality Studies in 2016 which runs into five volumes. Other work includes an influential training module introduction to Gender Mainstreaming Universities in 2010 for the Association of Commonwealth Universities, UK.

An expert on gender, she is a scholar whose work interfaces research, teaching, training, policy development, evaluation, advocacy, and activism.

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She counts over twenty-five years of experience in formulating gender equity and equality policies/strategies, conducting gender sensitization trainings and evaluating women's and gender programs for local and international organizations. Professor Wickramasinghe has been a frequent keynote speaker at various conferences organized by academic and professional institutions locally and internationally.

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**MARKETING LIBRARY SERVICES: A STUDY OF GNIMS  
BUSINESS SCHOOL LIBRARY, MUMBAI**

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**Abstract**

This research paper highlights the marketing services undertaken by the library of GNIMS Business School to promote their resources for their users and how the innovative strategies were initiated to obtain the maximum utilization of library resources. GNIMS library has employed many innovative library services to satisfy the new generation of users. The study explores the different marketing services that are seven P's, Price, Place, Promotion, Product, People, Process and Physical Evidence adopted by the GNIMS Library to provide value-added, need-based and user-oriented services and products to their users.

To promote the library resources and services, it is essential to market the library services and products. The findings of this research highlight that promotion of information resources increase the users in the library, the optimum use of library resources, the professionalism of library staff and the motivation of library staff.

The reading of the users has increased due to the value added activity conducted by the library. Active interaction with the users and library staff was observed. Users were impressed with the library infrastructure.

The major observation of this study was that the users were not willing to access the library resources until their teaching faculty pushes them to read or library hours were introduced to students' time-table. Hence it is the duty of the librarian to showcase and brand the library resources. GNIMS have reached the conclusion that the skill to market library resources will gain the users' maximum utilization of the resources and increase the regular visit of the users to the library for their information requirements.

**Keywords:** Marketing strategies, Library services, Library products, User satisfaction, Professional skills

## **Introduction**

Marketing guru, Kotler (1999) pointed out that organizations such as Museums, Universities, Libraries, and Charities need to market their courses. Marketing is the ongoing process of creating a connection between the library and its users. Research is a key element of Marketing. Librarians must seriously consider the users' requirements. Then, the library should establish the strategies to meet the users' needs and expectations to continue as a cycle.

Librarians must customize their services with their own personal brand and user requirements for maintaining relations with their users. Libraries should use digital media to allow their users to access knowledge anytime and anywhere. An efficient marketing plan is needed to understand the users need and requirements.

## **Literature Review**

Chandratre and Chandratre (2015) have discussed in their research that the nonprofit organizations like library is basically engaged in the production of services rather than goods. Services are distinct in nature primarily due to the characteristics of being intangible, inseparable, variable and perishable.

Zou, Chen, and Dey (2015) has mentioned that various businesses, cultural organizations, and social institutions are now looking to leverage all aspects of social media to accomplish their planned goals.

Kotler and Armstrong (1999) have mentioned that, marketing is the process of developing and implementing the conception, pricing, promotion and distribution of goods, services and ideas with target groups to satisfy the customers and to achieve organizational objectives. Under marketing, it was studied the concepts such as building customer relationships, branding, corporate identity, marketing communications, pricing policy, collecting marketing data, marketing strategy and planning.

Madhusudhan (2008) has highlighted some challenges for library marketing. The budget cuts, improved user requirements, the speedy growth of materials, rising costs, networking demands, competition from database vendors, and complexity in information requirements are compelling the professionals to adopt marketing concepts to improve the management of library and information centers.

According to Shafawi and Hassan (2018), the use of social media has a direct impact on libraries as it has been identified as an efficient platform for libraries to foster networking and enhance engagement with their user community.

## **Problem Statement**

This research is aimed to focus, how the library markets their products and services to reach each individual user and increase the utilization of library resources. Implementation of different value added activities is needed to market and connect users with the libraries and to increase utilization of the library resources.

## **Objective**

- To examine if the library services are effectively marketed to fulfill the users' requirements
- To examine if users are contented with library infrastructure
- To examine the interaction between the library staff and the users

## **Research Methodology**

This research is based on empirical research. Market segmentation was conducted for full-time and part-time students which the sample size was 100. The data have been collected from full-time users (Batch 2014-2016) and part-time users (Batch 2013-2016) of the institute and the responses analyzed by using Excel and Graph.

## **Findings**

The finding of the research was analyzed with MS Excel to understand how library services were marketed and made accessible to all users.

## ***P – Place***

The GNIMS Business School is situated in the heart of Mumbai City. GNIMS Library provides a favorable setting to users and it is furnished with



all the modern facilities, including Air-conditioned reading hall, Biometric Attendance System and CCTV cameras for security purpose and Wi-Fi system.

### ***P- Promotion***

Several value added activities are conducted and promotion of these activities are implemented through digital medium or social network. As a promotional activity, top 15 users are recorded in every month and best library users award is offered to the best users after the completion of their course.

### ***P-Product***

Personal assistance is offered to the user to locate the books or to search the e-resources in online databases. Value added activities are conducted to connect the users with the library.

E.g.: Author Outreach Programme, Business Situation Writing Competition, Book Review Competition, Connecting with the users, Library Session

### ***P-Price***

Library timing plays a crucial role on users' attraction with the library. As the library staff is aware the importance of the users' time, they always try to assist the user quickly and efficiently.

### ***P- People***

GNIMS library staff is professional in their behavior and maintain good relations with its users. The library staff members were trained in soft skills and made aware of the new innovations initiated in this field. The GNIMS Library team performs a good interpersonal relationship with library users.

E.g.: Orientation programmes, Training programs

**Table 1: Marketing strategies utilized by the GNIMS Library**

<b>Place</b>	<b>Promotion/ Marketing</b>	<b>Product</b>	<b>Price</b>	<b>People</b>	<b>Process</b>	<b>Physical Evidence</b>
Infrastructure	Compliance Activities conducted	Value Add	Time	Well Trained Library Staff	Procedure ISO / NBA	Facilities
Library Layout / Course Wise Self Display List of Books.	Utilization of Resources with different parameters.	Personal Assistance	Effort	Professional Library Staff	Location of Resources	Performance of the Library Staff
Expanding the Service Area	Course wise Promotion of Library Services	Reference Service	Search Engine – WEB - OPAC	Library Team Motivating User's	Library Mechanism - Biometric	Feedback
Library Website	Customer Relations	Online Database	Time Cost		Library Software – SLIM21	Communication / Notices by Email / Telephone.
Mobile App	Other Services	Inter-Library Loan	Efficient Service			Library Software – SLIM21
Resources Available		On-Demand Delivery	Save the Time of the User's			

---

Library open 12x7	Assistance to Access Online Database	Stress Relief Service
Different Channels to reach Users – TRF / Email / SMS / Class Representative's WhatsApp Group.		Off- Campus Service

---

### ***P- Process***

GNIMS Library is well equipped with the latest technology to meet the compliance of the International Standard Organization (ISO) certification and the National Board of Accreditation (NBA).

### ***P-Physical Evidence***

Communication with the library users is very important. All the library related notices are communicated to the users through different channels like official notices, SMS, emails and WhatsApp groups.

Feedback received from the users is contemplated and their suggestions are implemented as soon as possible. Library software SLIM21 is the main tool to connect with the users.

According to table 2, out of 40 respondents, 17 of the respondents have mentioned that circulation service, availability of books and library timings are excellent. 16 of the respondents have indicated that online databases, library resources, and Web-OPAC is excellent. Only 20 of the respondents have indicated that customer services, library website, and reading room facility is excellent.

**Table 2: Category of full-time respondents**

<b>Feedback</b>	<b>Excellent</b>	<b>Very Good</b>	<b>Good</b>	<b>Satisfactory</b>	<b>Fair</b>
Circulation	17	13	6	3	1
Online Databases	16	12	8	3	1
Library Resources	16	15	6	2	1
Reading Room	20	8	8	3	1
OPAC	16	14	7	2	1
Customer Service	20	10	7	5	1
Library Web	20	13	4	2	1
Availability of Books	17	14	6	2	1
Library Timing	17	13	7	2	1

**Table 3: Category of part-time respondents**

<b>Feedback</b>	<b>Excellent</b>	<b>Very Good</b>	<b>Good</b>	<b>Satisfactory</b>	<b>Fair</b>
Circulation	11	18	3	1	1
Online Databases	11	15	6	2	0
Library Resources	13	13	7	1	0
Reading Room	12	11	7	3	1
OPAC	10	11	11	1	1
Customer Service	8	17	7	1	1
Library Web	12	10	9	2	1
Availability of Books	10	13	9	2	0
Library Timing	8	18	6	2	0

Table 3 indicates that out of 34 respondents, 11 of the respondents have indicated circulation service and online databases are excellent, 12 of the respondents have mentioned reading room and library website are excellent and 13 of the respondents have highlighted that library resources are excellent.

The result of the study shows the followings;

- Users are impressed with the library infrastructure
- The promotion of information resources has increased the users in the library
- The optimum use of library resources is observed
- The professionalism of library staff has increased due to training and motivation
- Active interaction is established with the users and library staff
- The reading of the users has increased due to the value added activity conducted by the library

### ***Measuring the Influence of the Library***

To identify the influence of the library, it was measured the transactions of the users and the hours they have spent in the library. As the library services were well marketed, the users were converted themselves into life-time members of the library. It was found that even the students working in the corporate world, are still life-time members of the library and encourage their colleagues to become the members.

### **Discussion**

In this study, it was discussed how library services are marketed and the impact of marketing on the users. Different value added activities designed and executed by the library to promote the library services and to motivate the users to utilize the library resources.

Libraries need to develop an imaginative design of services, effective communication methods and proper feedback mechanism. This involves market research, objectives and strategies to implement the plan. Users must be made aware of all the library services and the resources available. The promotion of library services has affected to increase the usage of the library resources, the value of the library, and it has changed the perceptions of the library users.

Library staff plays a significant role in the identification of relevant resources and giving hands-on training to its users. GNIMS Library has always focused fulfilling user requirements as and when they need any information. GNIMS Library's USP (Universal Selling Proposition) is to conduct regular International or National conferences, workshops, seminars, and other value added activities not only for the Librarians but also for students, Faculties as well as library support staff. These activities are conducted for educational

professionals as and when required. This is the main Marketing strategy of the library and the institute.

The scope of this research is to employ more strategies to engage with users. GNIMS Library is planning a small kid zone for the life-time members. It is planned to engage the kids with some educational activities so that their parents keep coming to the library and utilize the resources. This will encourage more users to visit the library in future.

### **Recommendations**

Professional and skilled librarians should utilize the digital media to market their services and to develop groups of the users of similar interests. It is needed to update them with each and every news of the library. Also the users should be informed about the library events and the new addition to the library collection. Obtaining user feedback and immediate response to the users' queries is essential to maintain the regular communication with the users. It is required to evaluate the library users and need to keep a complete list of users with their requirements. The requirements of the users are collected through feedback to use in future. Librarians must market their services not only to promote the utilization of resources, but also to boost the profession and the role they play in educating the users.

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## **RANKING AND SCATTERING OF JOURNALS IN THE FIELD OF CHEMISTRY: A QUANTITATIVE ANALYSIS**

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### **Abstract**

The present study explores the distribution of citations from the perspective of bibliographic forms after examining 13,112 citations as reflected in the 55 doctoral theses submitted by research scholars in Chemistry to Acharya Nagarjuna University, Guntur, Andhra Pradesh, India during 2010-2015. It attempts to explore the distribution of citations based on the type and nature of the bibliography, besides considering various other vital factors such as the journal rank, journal productivity, age and periodicity of journals, including half-life period etc. In the academic and research arenas, journals disseminate scientific information offering the most visible and viable channel of communication. When the distribution patterns of the cited journals in the submitted theses in Chemistry were analyzed, a significant trend has emerged indicating appearance of a disproportionately higher number of citations in a restricted amount of journals. In fact, some journals even covered as much as

50 percent of the citations quoted in the submitted theses in Chemistry, within the range 1-58. 'The Journal of the American Chemical Society' attained the top rank among the journals in Chemistry in terms of the number of citations made in the theses reviewed. In another significant observation was that the oldest cited journal in the surveyed theses in Chemistry is 135 years old.

**Keywords:** Citation analysis, Chemistry, Doctoral theses, Bibliometric methods, Scientometric, Ranking of journals

## **Introduction**

The aim of any research initiative is to help the promotion of academic interests of a particular scholarly group or community to the larger strata of society in general. All research initiatives spanning across the spectrum are rational and reliable answers to enquiries when scientific procedures are applied whether they are applied or fundamental, quantitative or qualitative. The researcher usually goes through a clear sequence of processes like data collection, analysis and interpretation, before reaching a conclusion, which in other words, signals the successful resolution of the targeted problem. The researcher documents his findings, observations, results and rationale of the study in the form of a typical document, academically termed as either a research report, or a dissertation or a paper. The objective behind every research initiative is to ensure that its contents or formulations reach a larger group of people and support their information needs.

Bibliometric analysis deals with the analysis and assessment of the various patterns in which references from books and articles are cited, along with their rate of recurrence. Researchers employ citations in academic works for connecting to the other works as well as other researchers. In essence, bibliometric analysis explores the nature, relevance and quality of

relationships that the cited documents share with the citing documents. A cited document refers to the source of a reference as shown by the author as a part of his work, while the document that makes references of other documents is known as a citing document. Therefore, bibliometric analysis broadly encompasses the analysis of a spectrum of citations emanating from and into the documents, appended into the research communication with the count of citations. In general, the citations appear at the bottom of a scientific article along with its number, which is known as citation analysis. In fact, bibliometric analysis offers important perspectives into the relevance and influence of the scholars as well as their work on other prospective researchers based on the frequency, mode and quantum of references.

### **Review of Literature**

Citation analysis, an important aspect of bibliometric has widespread application in effective selection of most relevant journals in any given academic subject, besides identifying salient features like authorship pattern, classification of cited content in bibliographic forms etc. Citation analysis as a tool for identification of the core journals in a subject was pioneered by Gross and Gross (1927) who premised it on a calculation of the illustrated citations found at the concluding section of articles in a list of primary journals. Later, researchers have conducted similar studies to examine the critical aspects related to citations in a host of documents such as dissertations/theses, books, primary journals as well as review journals. The significant contributions of some scholars in on citation analysis have been documented in the following sections.

Kaur and Rattan (2018) explored some significant issues in citation by carrying a study on doctoral theses (92) submitted by research scholars in Economics at Punjab University, Patiala. The study encompassing the years

2000-2014, examines critical aspects in citations, such as the authorship pattern, digital/print form, chronological distribution and geographical distribution of books and core journal citations etc. In the outcomes of the study, journals emerge as the most utilized resources, as exemplified by 49.39 percent citations made by researchers in Economics. Here, the authors have applied Bradford's law of scattering with Bradford multiplier at 11.327.

Mahajan and Saini (2016) carried out a similar study on citations patterns in doctoral theses in Philosophy at Panjab University, Chandigarh. The study period covering the years 2002-2012, found that the researchers had the maximum preference for books for information in Philosophy with 40.67% of total citations. The researchers had preference for Journals next only to books with 17.99% citations. Quite significantly, the researchers applied Bradford's law of scattering for effectively identifying the most relevant journals in Philosophy.

Kusumakumari and Doraswamy (2015) conducted a similar study on citations patterns with a special focus on position and spreading of journals in doctoral theses in civil engineering at Osmania University, Hyderabad and Sri Venkateswara University, Tirupati. The authors examined the citations from the bibliography perspective and attempted distribution of citations in terms of bibliographic form, besides considering various other vital factors such as the journal rank, journal productivity, age and periodicity of journals, including half-life period etc. It may be recalled that Journals provide the most authentic channels of communication in dissemination of scientific information in view of redeeming features like referral system and wider distribution. However, when the distribution patterns of the cited journals in the submitted theses in civil engineering were analyzed, a significant trend has emerged indicating appearance of a disproportionately higher number of

citations in a restricted amount of journals, while some journals even covered as much as half of the citations quoted in the submitted theses, within the range 1-43. “Journal of Hydraulic Division” from United States of America attained the top rank among the journals in civil engineering in terms of the quantity of citations made in the theses reviewed. In another significant observation, the oldest cited journal in the surveyed theses in Chemistry is 132 years old.

### **Objectives of the Study**

The objectives of the present study are:

- To identify the allocation pattern of citations in different bibliographic forms
- To examine the ranking and distribution of core journals
- To find out the productivity of journals in Chemistry
- To know circulation of citations of journals in terms of age

### **Methodology**

In the present study, the data was primarily obtained from doctoral theses in Chemistry. The study centers on examination of 55 doctoral theses submitted by research scholars in Chemistry to Acharya Nagarjuna University, Guntur, Andhra Pradesh, India, 2010-2015. The researchers have identified 13112 citations for analysis as a part of this study with every thesis contributing 238 citations on average. The authors studied all the appended citations as appearing in the submitted theses in the field of Chemistry. The authors examined the citations and recorded findings on significant aspects like author types, bibliographic forms, publication time, publisher credentials, name of the journals, country etc. on reference cards measuring 12.5 X 7.5 cm (standard size). Ulrich’s International Periodical Directory was referred to obtain information on cited journals, such as the publishing country, the

relevant subject, which was then transcribed in the reference cards and later entered into MS-Excel work sheet. Finally, the data processing was done through a tool i.e. the Statistical Package for Social Sciences (SPSS).

## **Result and Discussions**

### ***Bibliographic Forms***

The sharing of citations as per the different forms of documents in the submitted theses in Chemistry is presented in table 1. It is obvious from the table that journals contribute the maximum quantity of citations, accounting for 80.81 percent of the total citations. Books held the second maximum number of citations, accounting for 12.65 percent of the total citations, followed by patents (1.30%), conference/ seminars/ workshops/ conventions etc. (1.24%), reports/reviews (0.96%), websites (0.90%), dissertations/thesis (0.86%), and newspapers (0.41%). The remaining 0.87 percent of citations is found in other bibliographic forms. Hence, the Chemistry research scholars are mostly preferred sources of information is journals.

**Table 1: Form-wise sharing of citations in Chemistry**

<b>Types of forms</b>	<b>Number of Citations</b>	<b>Percentage</b>
Journals	10596	80.81
Books	1658	12.65
Patents	171	1.30
Conferences/seminars/ workshops/ Conventions etc.	162	1.24
Reports/Reviews	126	0.96
Websites	118	0.90
Others	114	0.87
Theses/Dissertations	113	0.86
Newspapers	54	0.41
<b>Total</b>	<b>13112</b>	<b>100.00</b>

**Rank List of Journals in Chemistry**

The ranking of journals as per the distribution of citations of articles in Chemistry is exhibited in table 2.

**Table 2: Ranking list of journals in Chemistry**

S. No	Name of the journal	Citations			Cumulative	
		Rank	No	%	No	%
1	The Journal of the American Chemical Society	1	518	4.89	518	4.89
2	Tetrahedron Letters	2	467	4.41	985	9.30
	The Journal of Organic Chemistry	3	434	4.10	1419	13.40
4	Journal of Medicinal Chemistry	4	205	1.94	1624	15.34
5	Organic letters	5	173	1.63	1797	16.97
6	Journal of Chromatography B	6	157	1.48	1954	18.45
7	Chemical Reviews	7	151	1.43	2105	19.88
8	Bioorganic & Medical Chemistry Letters	8	149	1.41	2254	21.29
9	Journal of Pharmaceutical and Biomedical Analysis	9	147	1.39	2401	22.68
10	Bioorganic & Medicinal Chemistry	10	126	1.19	2527	23.87
11	Synthesis	11	123	1.16	2650	25.03
12	Analytical Chemistry	12	121	1.14	2771	26.17
13	Chemical Communications	13	117	1.11	2888	27.28
14	European Journal of Medicinal Chemistry	14	113	1.07	3001	28.35
15	The Journal of Chemical & Engineering Data	15	110	1.04	3111	29.39
16	Indian journal of Chemistry.	16	105	0.99	3216	30.38
17	PhytoChemistry	17	103	0.97	3319	31.35
18	Nature	18	99	0.94	3418	32.29
19	Journal of the Chemical Society	19	96	0.91	3514	33.20



20	The Journal of Chemical Thermodynamics	19	96	0.91	3610	34.11
21	The Journal of Natural Products	19	96	0.91	3706	35.02
22	Liquid Crystals	20	86	0.81	3792	35.83
23	Science	20	86	0.81	3878	36.64
24	Talanata	21	80	0.76	3958	37.40
25	Chemistry Letters	22	78	0.74	4036	38.14
26	Synthetic Communications	23	77	0.73	4113	38.87
27	Journal of Materials Chemistry	24	73	0.69	4186	39.56
28	The Journal of Physical Chemistry A	25	72	0.68	4258	40.24
29	The Journal of Antibiotics	26	67	0.63	4325	40.87
30	Journal of Chromatography A	27	66	0.62	4391	41.49
40	European Journal of Organic Chemistry	28	65	0.61	4456	42.10
42	2 Journals with 60 citations each	29	120	0.57	4516	42.67
44	2 Journals with 55 citations each	30	110	0.52	4631	43.76
45	Journal of the Chemical Society, Perkin.	31	52	0.49	4738	44.77
47	2 Journals with 50 citations each	32	100	0.47	4788	45.24
48	Journal of Molecular Liquids	33	48	0.45	4886	46.16
49	Advanced Materials	34	47	0.44	4933	46.60
50	Cancer Research	35	46	0.43	4979	47.03
52	2 Journals with 44 citations each	36	88	0.42	5023	47.45
53	Chemistry - A European Journal	37	43	0.41	5110	48.28
54	Fluid Phase Equilibria	38	42	0.40	5152	48.68
55	Chemical and Pharmaceutical Bulletin	39	41	0.39	5193	49.07
56	Journal of Solution Chemistry	40	40	0.38	5233	49.45
57	Indian Drugs	41	39	0.37	5272	49.82
60	3 Journals with 37 citations each	42	111	1.05	5383	50.87

63	3 Journals with 36 citations each	43	108	1.02	5491	51.89
67	3 Journals with 35 citations each	44	105	0.99	5596	52.88
69	2 Journals with 34 citations each	45	68	0.64	5664	53.52
71	2 Journals with 33 citations each	46	66	0.62	5730	54.14
74	3 Journals with 32 citations each	47	96	0.91	5826	55.05
78	4 Journals with 31 citations each	48	124	1.17	5950	56.22
83	5 Journals with 30 citations each	49	150	1.42	6100	57.64
85	2 Journals with 29 citations each	50	58	0.55	6158	58.19
87	2 Journals with 28 citations each	51	56	0.53	6214	58.72
89	2 Journals with 27 citations each	52	54	0.51	6268	59.23
90	Inorganic Chemistry	53	25	0.24	6293	59.47
92	2 Journals with 24 citations each	54	48	0.45	6341	59.92
95	3 Journals with 23 citations each	55	69	0.65	6410	60.57
99	4 Journals with 22 citations each	56	88	0.83	6498	61.40
102	3 Journals with 21 citations each	57	63	0.60	6561	62.00
105	3 Journals with 20 citations each	58	60	0.57	6621	62.57
110	5 Journals with 19 citations each	59	95	0.90	6716	63.47
114	4 Journals with 18 citations each	60	72	0.68	6788	64.15
117	3 Journals with 17 citations each	61	51	0.48	6839	64.63
126	9 Journals with 16 citations each	62	144	1.36	6983	65.99
134	8 Journals with 15 citations each	63	120	1.13	7103	67.12

139	5 Journals with 14 citations each	64	70	0.66	7173	67.78
145	6 Journals with 13 citations each	65	78	0.74	7251	68.52
153	8 Journals with 12 citations each	66	96	0.91	7347	69.43
166	13 Journals with 11 citations each	67	143	1.35	7490	70.78
181	15 Journals with 10 citations each	68	150	1.42	7640	72.20
193	12 Journals with 9 citations each	69	108	1.02	7748	73.22
220	27 Journals with 8 citations each	70	216	2.04	7964	75.26
235	15 journals with 7 citations each	71	105	0.99	8069	76.25
274	39 journals with 6 citations each	72	234	2.21	8303	78.46
340	66 journals with 5 citations each	73	330	3.12	8633	81.58
413	73 journals with 4 citations each	74	292	2.76	8925	84.34
535	122 journals with 3 citations each	75	366	3.45	9291	87.79
808	273 journals with 2 citations each	76	546	5.15	9837	92.94
1567	759 journals with 1 citation each	77	759	7.16	10596	100.00

Table 2 shows the ranking list of journals in Chemistry. It was observed that the journal citations made by research scholars of Chemistry are derived from as many as 1565 journals. “The Journal of the American Chemical Society” occupies the first rank for being cited the maximum number of times with 4.89 percent of the total citations, followed by ‘Tetrahedron Letters (4.41%)’, “The Journal of Organic Chemistry” (4.10%), ‘Journal of Medicinal Chemistry’ (1.94%), ‘Organic letters’ (1.63%), Journal of Chromatography’ (1.48%), ‘Chemical Reviews’(1.43%), ‘Bioorganic & Medical Chemistry Letters’ (1.41%), ‘Journal of Pharmaceutical and

Biomedical Analysis' (1.39%) and 'Bioorganic and Medical Chemistry' (1.19%). The result shown at serial number 42, 44, 47, 52 and from 60 to the last row under Table 2 were arrived by following the procedure described below.

From example, the result at serial number 42 represents 60 citations by only two journals. So, the result is pegged at 120 citations i.e. multiplied by the number of journals with number of citations. Similarly, all the parameters from serial numbers 44, 47, 52, and from serial numbers 60 to serial numbers 1567 have also been calculated on similar lines.

### ***Output of Journals in Chemistry***

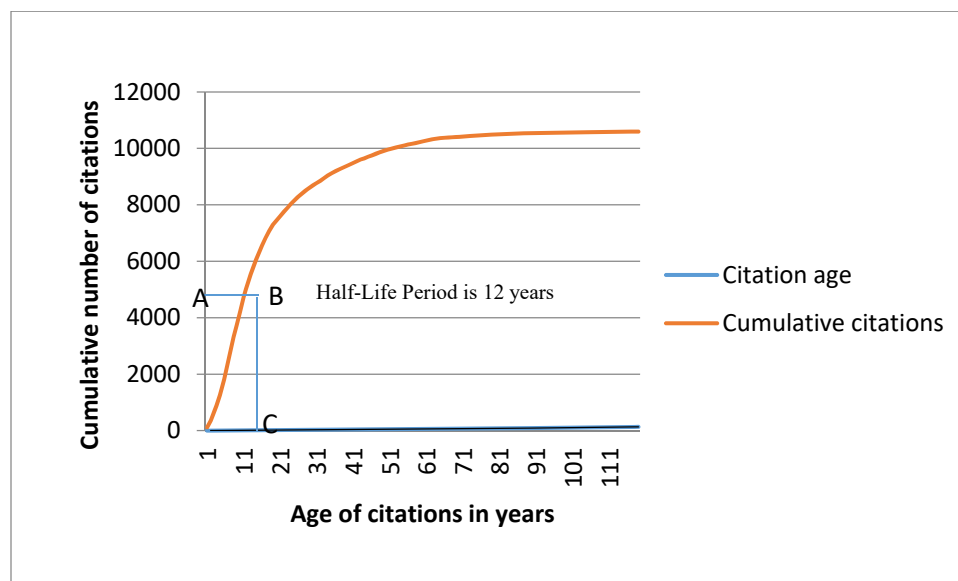
The output of cited journals in Chemistry is exhibited in table 3. As illustrated in table 3, in Chemistry literature, the first 25% of citations are from the 11 journals viz., "The Journal of the American Chemical Society", 'Tetrahedron Letters', 'The Journal of the Organic Chemistry', 'Journal of Medical Chemistry', 'Organic Letters', 'Journal of Chromatography-B', 'Chemical Reviews', 'Bioorganic and Medical Chemistry Letters', 'Journal of Pharmaceutical and Biomedical Analysis', 'Bioorganic and Medicinal Chemistry' and 'Synthesis'. The normal rate of output of the journals in the first group is 240.91 articles, followed by the second group with 56.57 articles. It is observed that 16.59 articles fall in the third group, whereas there are only 1.95 articles in the last group. Hence, one notices that there is a disproportionately higher number of citations from 11 journals.

**Table 3: Output of journals in Chemistry**

S. No	Percentage of Citations	Citations	Journals covered	Percentage of Journals	Average output of articles
1	0 – 25%	2650	11	0.70	240.91
2	26 – 50%	2659	47	3.00	56.57
3	51 – 75%	2655	160	10.23	16.59
4	76 – 100%	2632	1347	86.07	1.95
<b>Total</b>		<b>10596</b>	<b>1565</b>	<b>100.00</b>	<b>6.77</b>

***Age-wise Distribution of Citations in Chemistry***

The Age-wise classification of citations of journals in the field of Chemistry reveals that 25% of the journal citations are 6 years old, while 50 % of journal citations are 12 years or less than 12 years old. About 75% of journal citations are found to be 23 years old or less than 23 years old. This shows that researchers in Chemistry tend to mostly cite articles published in the latest journals.

***Half-life of Citations*****Figure 1: Age-wise distribution of citations in Chemistry**

A graph is plotted by taking into account the age of citations (in years) on X-axis and the cumulative number of citations on Y-axis to determine the half-life of citations. A line parallel to the X-axis is drawn from a point, preferably 'A' representing the half of the citations to meet the curve say 'B'. Then, perpendicular to X-axis (BC), this line is drawn from point to meet the X-axis at C. 'C' represents the half-life period of citations. So, the observed half-life period is 12 years as exhibited in figure 1.

## **Discussion**

Citation analysis is an analytical tool which deals with reference citation of scientific papers undertaken by users. Citation analysis functions as an effective evaluation tool in various scientific sub fields wherein journals are the formal channels of communication. The present study has examined various critical aspects such as bibliographic forms, ranking list of journals, productivity of journals, age-wise distribution of journals and half-life period journals etc. The findings of the study indicate that journals provide the maximum quantity of citations (80.81%) out of the total number of citations. Books secured the second maximum quantity of citations (12.65%). These two findings are similar to the findings made by Raju (2014) and Zafrunisha (2012). As far as subject-wise usage is concerned, the researchers in Chemistry mostly preferred "The Journal of the American Chemical Society". Moreover, respondents seemed to cite "The Journal of the American Chemical Society", largely due to the availability of relevant abstracts pertaining to their research. In the first group, the average rate of output of journals is 241 articles (refer table 2), which shows the deliberation of citations found in a few journals, not uniformly spread out across journals.

Citation frequency implies a relation between usage and time; and the effect of time, which are effects of time past, time present, and time future.

The studies on aging or frequency of documents usually assess the decline in the use of a representative set of documents over time. Here, it is also important to note that growth in the literature of a particular field plays a dominant role in age distribution. Such studies help the library professionals in deciding the documents that are kept or discarded so that a proper need-based collection in libraries is maintained. In order to compare the speed of decay in different subjects, 'half-life' is used as a measure. Half-Life refers to the time during which half of the current active literature is published. The present study observes that the half-life period for journal citations is 12 years in the subject of Chemistry. In their study, Kumari and Doraswamy (2015) obtained a half-life value of 13 years in Civil engineering, while Raju (2014) obtained a half-life period of 17.10 years in Physics. These findings clearly indicate that the obsolescence rates differ from one subject to another.

## **Conclusion**

The present study was undertaken to examine citation analysis in literature employed by researchers in the field of Chemistry. In this study, citation analysis techniques were applied to analyze the citations in general. The present study examined citations numbering 13112 appearing in 55 theses submitted by researchers in Chemistry. Different bibliographic forms, like books, journals, conference/seminar proceedings, theses/dissertations, reports websites etc. are found as referred by researchers. In Chemistry, amongst all the bibliographic forms, journals are the most preferred sources. The finding of the study underscores the dominant habit among researchers to use journals most frequently, justifying its indispensability for quality research and academic pursuits. No wonder, journals have emerged as the most primary and authentic channels of communication for scientific information sharing and dissemination. The distribution of cited journals in Chemistry clearly indicates

that a very small number of journals seem to be contributing to the maximum number of citations as reflected in the findings from the study of select theses in Chemistry, with a few journals even accounting for half of the citations ranging between 1 and 58 journals. In Chemistry, “The Journal of the American Chemical Society” is shown gathering the maximum number of citations, while the oldest journal cited is aged 135 years.

## **Recommendations**

The present study explores a bibliometric study of citations in doctoral theses in Chemistry submitted to Acharya Nagarjuna University, Guntur, Andhra Pradesh. In light of the observations and conclusions drawn from the study, similar types of investigations can be carried out on doctoral theses in Chemistry at other universities of Andhra Pradesh, India. Moreover, the specific findings of the study can be generalized and applied to other doctoral works in any subject or discipline to gain an in-depth knowledge of the citation analysis techniques used by researchers. The findings and conclusion of this particular research paper can be applied to explore bibliometric studies of citation in theses submitted to other Indian Universities in Chemistry as well as any other discipline.

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**ENHANCING THE STUDENTS' LIBRARY BORROWING SKILLS  
IN UNIVERSITY COLLEGES IN TECHNICAL VOCATIONAL  
EDUCATION AND TRAINING (TVET) SECTOR IN SRI LANKA:  
PRESENT PROBLEMS AND FACTORS AFFECTING**

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**Abstract**

Technical Vocational Education and Training (TVET) sector is one of the major sectors which is based on job oriented learning system that produce skilled labour into the job market in Sri Lanka. The "University Colleges" are newly established area in TVET sector, which is essential and has significant contribution for producing skilled middle level technical and managerial personnel for filling the gap of labour markets in Sri Lanka. The 09 courses offered by "University College of Matara (UCM)", focus on teaching and giving training on industrial-specific skills. The Library facility is very important for providing essential support for teachers and students, for achieving their information needs under the workplace-based environment. The purpose of this paper is to identify factors affecting in enhancing students' borrowing skills of library books and identifying the main problems students face when borrowing.

This research is based on Hypothesis testing used for four independent variables (examination reference purpose, Laboratory/Workshop practical module reference purpose, teacher's guide book reference purpose and additional reference reading purpose) that were examined for their relationship

with students' borrowing skills. The sample consists of top borrowers, and 60 students had been selected from University College of Matara during the period from 2016 to 2018. The population of the study is University Colleges in the TVET sector in Sri Lanka. The structured interviews method which used five-point scale weighted questions were used for the data collection in this study.

The study demonstrated that statistical evidence to teacher's guide books was significantly associated with enhancing students' borrowing skills. Lack of English language skills and lack of reading interest were identified as problems for students' borrowing. The study suggests the need of changing teacher's teaching behaviour, such as using a reference book, guide book or any text materials for the daily lessons, which assists to enhance students' borrowing skills.

**Keywords:** Borrowing skills, Borrowing factors, Borrowing problems, University college, Technical vocational education

## **Introduction**

The Sri Lankan tertiary education system consists of national universities, postgraduate institutes, higher education institutes and technical and vocational education and training centers. The Technical Vocational Education and Training (TVET) sector is one of the major sectors in Sri Lanka based on job oriented learning system which produce skilled labour markets in Sri Lanka. TVET is a job-based learning system that promotes the productivity of apprentices with improving their working capacity. TVET is defined by Sri Lankan Government Gazette as "education and training imparted to persons for the acquisition of knowledge, operative skills, technical or craft skills or experience needed for the pursuit of an occupation

or trade" (Democratic Socialist Republic of Sri Lanka, 1995). UNESCO Glossary define it as "Technical and vocational education refers to all forms and levels of the educational process involving in addition to general knowledge, the study of technologies and related sciences and the acquisition of practical skills, attitudes and understanding relating to occupations in the various sectors of economic and social life" ("UNESCO-UNEVOC TVETipedia," n.d.). Specially, Sri Lankan government has understood the importance of youth energy and building their knowledge, skills, attitudes and behaviour that are required within the workplace. These qualifications are the most capable skills for enhancing the productivity of the industrial sector in developing countries today.

The University of Vocational Technology (UNIVOTEC) was established under the parliamentary act no. 31 of 2008. According to the act, the university of vocational technology can provide higher education at the university level on vocational technology and it granted the permission to the establish, maintain and administer as a university (Parliament of the Democratic Socialist Republic of Sri Lanka, 2008). UNIVOTEC fundamental aim is to deliver higher education in the Technical Education and Vocational Training System with support in the personal development of students in achieving knowledge, skills and attitudes that were needed for building a professional trainer.

The six (06) University Colleges have been established in the year 2014 by the Ministry of Skills Development and Vocational Training of Sri Lanka, under the provisions in the University of Vocational Technology. University College of Matara (UCM) is established to produce globally competitive and productive middle level technical and managerial personnel to meet the demand in both domestic and foreign labour markets ("About Us,"

2015). UCs will also help to produce a skilled labour force that is needed to acquire national economic development with the ability to manage and adapt global technology changes. The University College of Matara (UCM) offers 09-course programmes in the National Vocational Qualification (NVQ) Level 6 (Higher National Diploma) qualifications under the evaluations of Tertiary and Vocational Education Commission (TVEC) Sri Lanka. Nowadays more than 400 students are following the courses in UCM and only 238 students registered in the library and 94 students (39.5% by registered students) have borrowed items from library within past 3 years. The UCM library collections include more than 3000 books and other printed materials. The entire ministry has annually allocated nearly Rs. 2 million Sri Lankan rupees capital allocation for each University Colleges to purchase subject relevant printed materials to the library and UCM library staff is always working to increase the students' library books borrowing percentage up to 70 % by registered students before the end of year 2020. This study was aimed to examine the factors that affect to enhance students' borrowing skills at UCM and its results could be adapted to minimize the borrowing problems of the students in all the University Colleges in the TVET sector in Sri Lanka.

### **Literature Review**

Many researches have indicated that TVET sector plays a very important role in Sri Lankan education sector. The TVEC sector consists of many different types of educational institutes such as University Colleges, College of Technology, Technical Colleges and Vocational Training Centers, established widely in Sri Lanka. The TVEC website recently showed that 233 different types of educational institutes were established Island wide ("Tertiary and Vocational Education Commission – Tertiary and Vocational Education Commission," n.d.).

According to the Sri Lanka University Grant Commission statistics 2017, between 2010 and 2017 59% students who were eligible to enter the University by passing G.C.E. (A/L) examination were not selected to the universities. The actual selected percentage during 2010 - 2017, is less than 18% (University Grants Commission - Sri Lanka, n.d.). According to the Central Bank of Sri Lanka, 877,605 students were eligible to higher education during 2010 to 2016 but had admitted only 155,020 students (17.7%) to the universities (Central Bank of Sri Lanka, 2017). However, the same report shows that 13,514 (1.5% per eligible students) students enrolled for Advanced Diploma level (NVQ 5 & 6) to the vocational education sector such as College of Technology and Technical Colleges in the same period. Thus it shows that the balance 80.8% of qualified students do not have an avenue to continue their higher education needs due to the restricted opportunities in the recognized universities or vocational education institutions. A study of conducted under International Labour Organization as a part of the National Skill Sector Development Programme (SSDP) 2014-2020, suggested that the development of cognitive skills through the school system is particularly important as it determines the extent to which individuals can acquire both technical and soft skills (Chandrasiri & Gunatilaka, 2015). The results show that limited opportunities available in education and the importance of TVET sector development in Sri Lanka.

The Labour Demand Survey conducted in 2017 by Department of Census and Statistics shows the existing gap of specially in middle level and top level skilled or semi-skilled labour demand in Sri Lanka. According to the statistics of a survey, there was a very smaller percentage in middle level and top level skilled or semi-skilled workers as Professionals (8.6%), Associated Professionals (6.2%) and Managers (7.8%) fitting the labour market (Department of Census and Statistics, 2017). As Suraweera, and Edirisooriya

(2008) have highlighted in their study, TVEC has discovered that 84% of labours haven't followed a proper training. The Central Bank of Sri Lanka - Annual Report 2017 also highlights that "A large gap has been created between the requirements of job creators and the expectations of job seekers, leading to labour shortages in the domestic market" (Central Bank of Sri Lanka, 2018). All these factors show the validity of TVET education and middle-level skilled labour gap in Sri Lankan labour market. Therefore, the government should establish the new TVET institutes to produce the opportunities for those who need higher education after the G.C.E. (A/L) examination, Sri Lanka. The education national policy designed by National Education Commission Sri Lanka proposed to establish new institutions and expand existing technical and vocational education institutions to provide more educational opportunities for school leavers. ("National\_Policy - 1997," n.d.) This policy report indicated the importance and future demand for skill basis vocational degrees more than conventional degrees. Especially it is required to establish the institutions to offer Higher National Diploma (HND) for those who passed G.C.E. (A/L) examination and not selected to the government universities.

The Library facility is very important to an institution for all the academic activities. Further, Sri Lankan Education framework identifies the strategies policy implementation such as "Library facilities necessity for state universities and higher education institutions as a learning support units encourage to students' study discipline, acquire generic skills, a positive work ethic and ability to adapt to the world of work" (National Education Commission - Sri Lanka, 2009). The literature discusses the evidence for relations between student attainment and their library activities such as library usage, library borrowing and e-resource usage. An Australian study was conducted by Wells (1995) to examine the positive correlation between

academic attainment and the practice of the different types of library resources. This study shows the role of the library and demonstrates that when students use library resources, they can achieve success in their academic activities such as examination and assignments (Wells, 1995). Similarly, the University of Wollongong (UOW) in New South Wales, Australia, conducted a study and found a very strong relationship between students evaluations and the use of library resources (Cox & Jantti, 2012). A study conducted with 33,074 undergraduate students through eight U.K. universities found a positive relationship between library resource used and level of degree results (Stone & Ramsden, 2013). In that study, library usage data was measured by total number of library resources borrowed from the library, total number of logins to e-resource/database and counting the number of times that students entered to the library. Another study conducted by the Hong Kong Baptist University Library found evidence of a positive relationship between student library resource usage and their grade point average (GPA) results (Wong & Webb, 2011). The University of Cape Town conducted a study comparing the students' library resource usage with students' success rate in a particular exam and their cumulative GPA value. The study indicated that more library resource usage associates positively with enhanced students' educational success (de Jager, Nassimbeni, Daniels, & D'Angelo, 2018). Those studies highlight the importance of library resources usage by the student and it encourages the institutions to provide the proper borrowing facilities, at the institutional level.

Researchers from the University of Minnesota demonstrate the value of library resource usage in the first year students for their daily academic activities and how that practice support to achieve the academic success. This study suggested the importance of arranging the academic counselling and orientation programmes to promote the first year students' awareness on



library resources and services. It was identified four positive library resource factors that affect the students' academic success such as usage of library materials, usage of online databases, usage of electronic periodicals, and books borrowing (Soria, Fransen, & Nackerud, 2013). Huddersfield University in UK conducted a study and found the importance of library books borrowing and accessing electronic resources. This study also demonstrates the positive relationship between those two factors and students' academic performance (Goodall & Pattern, 2011). Porat and Fine (2009) examined the information seeking behaviour of Inter Library Loan and Document Supply (ILDS) users and Non-ILDS users. The study found that, ILDS users regularly borrow books and they are the profound type of information seekers. Further, the study revealed that, the Non-ILDS users rarely borrow books and they are shallow type information seekers. Those studies explained the importance of library books borrowings and how it positively associated with students' academic achievements.

In summary, most of the literature points out the importance of library usage for student attainments. But there are very limited studies were conducted on library usage of the HND education institutes in Sri Lanka.

### **Objective of the Study**

This study was aimed to identify the potential factors that affect students' borrowing skills and to identify the main problems which faced by the students when borrowing materials at the University Colleges in TVET sector in Sri Lanka.

Objectives of the study are,

1. To identify the students' borrowings of subject materials in UCM.
2. To analyze the relationship between borrowing skills and related factors

3. To identify the major problems which students face when borrowing the materials

## **Methodology**

Regression analysis is the statistical research method used for this study. Hypothesis testing was used for identifying the potential factors that affect students' borrowing skills and made conclusions. University College of Matara (UCM) offered 09-course programmes and 94 students borrowed library books within last 3 years were selected as the key informant interviewee in the study. 60 students (top 60 borrowers selected from 94 borrowers during the period of the year 2016 to 2018) were selected as sample from UCM for the study. This study was only based on primary data. The structured interviews method was selected for the data collection in this study. Five-point scale structured questions under the several borrowing purposes used to weigh for managing and coding the data. SPSS version 22.0 statistical data analysis package was used to analyze the collected data for testing and achieving objectives of the study.

## **Hypotheses**

- H1: There is a positive relationship between students' borrowing skills and examination reference purpose.
- H2: There is a positive relationship between students' borrowing skills and Laboratory/Workshop practical module reference purpose
- H3: There is a positive relationship between students' borrowing skills and teacher's guide book reference purpose
- H4: There is a positive relationship between students' borrowing skills and additional reference reading purpose

## **Results**

There were 73.3% (44) female respondents and 26.7 % (16) male respondents among the total number of sixty (60) interviewers. All the respondents were below the age 29 years. Among them, 30.0% (18) of the respondents were 3<sup>rd</sup> year students of 2015 batch and 23.3% (14) of the respondents were 2<sup>nd</sup> year students of 2016 batch. Other 46.7% (28) of the respondents were 1<sup>st</sup> year students of 2017 batch.

As displayed in table 1, the mean of the data distribution was 4.05. Thus, the result displays that the subject textbook borrowing of respondents was "high". The skewness and Kurtosis test value of the data distribution showed as -0.059 and -0.730, both well within  $\pm 1.96$  limits. The distribution was highly skewed. The data recorded for ability of subject textbook borrowings were approximately normally distributed.

In multiple regression analysis, examination reference purpose, additional reference reading purpose, Laboratory/Workshop practical module reference purpose, and teacher's guide book reference purpose were significantly and independently associated with students' borrowing skills.

**Table 1: Ability of subject textbook borrowing**

N	Valid	60
	Missing	0
Mean		4.05
Median		4.00
Mode		4
Std. Deviation		0.675
Skewness		-0.059
Std. Error of Skewness		0.309
Kurtosis		-0.730
Std. Error of Kurtosis		0.608

According to the bivariate analysis which includes correlation analysis (Table 2) found that there was a positive relationship between students' borrowing skills and teacher's guide book reference purpose. The Pearson correlation value was 0.452 significant at the 0.01 level (1-tailed) and that result indicated a positive relationship between these two variables. In stepwise regression model, R<sup>2</sup> value showed as 0.204 indicating 20.4% of the variance in the skills of subject textbook borrowing.

It was identified as a weak positive correlation between students' borrowing skills and borrowing purpose of Laboratory/Workshop practical module reference. The Pearson correlation showed the value as 0.272 significant at the 0.05 level (1-tailed).

There was no correlation between students' borrowing skills and borrowing purpose of additional reference reading. The Pearson correlation showed the value as 0.077 which was not significant.

There was no correlation between students' borrowing skills and borrowing purpose of examination reference. The Pearson correlation showed the value as 0.100 which was not significant.

This study was to identify the problems faced by students while they access the library to borrow books. According to the responses, lack of English language skills (81.7 % - 49 respondents) was the prominent problem faced by them. Lack of time management with busy lecture schedules (56.7 % - 34 respondents) and lack of reading interest (21.7 % - 13 respondents) were identified as other major issues of the students in university college when they access the library to borrow books.

**Table 2: Correlation between dependent variable and four independent variables**

		<b>Subject Text book Lending</b>	<b>Additional Reading</b>	<b>Guidebook</b>	<b>Practical</b>	<b>Examination</b>
Subject Textbook Lending	Pearson	1	0.077	0.452**	0.272*	0.100
	Correlation		0.280	0.000	0.018	0.223
	Sig. (1-tailed)	60	60	60	60	60
	N					
Additional Reading	Pearson	0.077	1	0.045	0.067	0.000
	Correlation	0.280		0.366	0.307	0.500
	Sig. (1-tailed)	60	60	60	60	60
	N					
Guidebook	Pearson	0.452**	0.067	1	0.099	0.143
	Correlation	0.000	0.307		0.226	0.138
	Sig. (1-tailed)	60	60	60	60	60
	N					
Practical	Pearson	0.272*	0.067	0.099	1	-0.112
	Correlation	0.018	0.307	0.226		0.198
	Sig. (1-tailed)	60	60	60	60	60
	N					
Examination	Pearson	0.100	0.000	0.143	-0.112	1
	Correlation	0.223	0.500	0.138	0.198	
	Sig. (1-tailed)	60	60	60	60	60

\*\* - Correlation is significant at the 0.01 level (1-tailed)

\* - Correlation is significant at the 0.05 level (1-tailed)

## **Discussion**

This study demonstrates the impact of some factors on the borrowing of library books and that will help to enhance students' borrowing skills at the University Colleges in the TVET sector in Sri Lanka.

According to the hypothesis test, H3 is accepted. It was shown that there was a 20.4% impact of teacher's guide book borrowing on the skills of subject textbook borrowing which was significant at 0.000. ( $0.010 < 0.05$ ). Thus, this result displays that there was a significant impact of teacher's guide book on the borrowing skills of the students of University Colleges in the TVET sector in Sri Lanka

Lack of English language skill, lack of reading interest, lack of time management with busy lecture schedule were identified as the major barriers and challenges faced by students when they access the library to borrow books.

This study was used to identify only four variables under the borrowing purpose. But there are some other purposes which are related to the students' borrowing skills. Therefore, selecting only four borrowing purposes is a limitation of this study. Also, data were collected only from University College at Matara. But there are five (05) other University Colleges in Sri Lanka. Other university colleges are established in different areas in the country. The long distance and the time needed to reach to other four university colleges were the main reasons for not selecting remaining four university colleges in this study.

## **Conclusion**

This study was to identify the "high" responses of students' on subject textbook borrowing selection at UCM. According to the results of the study,

teacher's guide books was significantly associated with enhancing students' borrowing skills at University Colleges in the TVET sector in Sri Lanka. Also, the result has shown that there is a positive relationship between teacher's reference guide books and students' borrowing skills. This factor could be used to enhance the students' borrowing skills in University Colleges in TVET sector in Sri Lanka. Lack of English language skills, lack of reading interest, lack of time management with busy lecture schedules were identified as the major issues faced by the students when they borrow library books.

### **Recommendations**

According to the study, there are several recommendations for university colleges to enhance their students' borrowing skills related to the academic activities.

This research would be very important for all the University Colleges in the TVET sector in Sri Lanka. The research provides guidance to change the teacher's behaviour and attitudes towards improving better practices of their students' borrowing interest. First, the study was recommended for changing the teacher's teaching behaviour, such as using a reference book, guide book or any text material for the daily lessons and it assists to enhance students' borrowing skills. This will provide important information to all the educational institute in the TVET education sector in Sri Lanka for enhancing their own academic performance. Secondly, it is highly recommended to conduct laboratory/workshop practical modules with supporting library textbooks. That practice will make some assistance to enhance students' borrowing skills in University Colleges in TVET sector in Sri Lanka.

Thirdly, the study is recommended to design and conduct the awareness programmes on library resources and services for the students to

indicate the importance of library books borrowings that highlighting how these materials help to students' daily academic activities. The fourth recommendation is to modify the new students' orientation programme as a set priority to library sessions and activities. The study conducted by Wong and Cmor (2011) has indicated that delivering of library awareness programmes has a positive relationship with students' performance.

Final recommendation is to re-schedule the annual academic activity plan with increasing English language learning hours and allocating fixed time slot in master time table for the library hours. That adjustment will help to reduce major barrier and challenges of students when they visit the library to borrow materials in University Colleges in TVET sector in Sri Lanka.

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## **INFORMATION SEEKING BEHAVIORAL EXPRESSIONS OF MEDICAL UNDERGRADUATES IN SRI LANKA**

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**Keywords:** Information seeking behavior, Integrated behavioral model,  
Medical undergraduates, Behavioral intentions

### **Introduction**

Information seeking is the process of searching, finding information and generating new knowledge (Korobili, Malliari & Zapounidou, 2011). Information seeking behavior is seeking information purposively as a consequence of a need to satisfy some goals (Wilson, 2000). Mostly, it is an active process (Ingwersen & Jarvelin, 2005); but it can be passive in certain instances (Wilson, 2000).

There were several theoretical models used in information seeking behavior, Elli's model of information behavior (Ellis, 1989), Information search process (ISP) (Kuhlthau, 1991), Vakkari's Task-based information retrieval process (Vakkari, 2001), Foster's Nonlinear Model of Information Seeking Behavior (Foster, 2004), etc. They may relate to each other and have

different stages of evolution of predicting voluntary behavior, e.g. information seeking behavior. The 'Integrated Behavioral Model' (IBM) is used in this study. The IBM is a combination of two theories, the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). In IBM, the most important determinant of the behavior is intention. Intention plays a major role in executing a behavior. Behavioral intention is determined by attitude, perceived norms and personal agency. IBM describes that there are four additional factors, knowledge and skills to perform the behavior, salience of the behavior, environmental constraints and habit that may transcend intention, and that directly affect the execution of a given behavior in addition to intention.

### **Scope of the Study**

Considering the importance of understanding user behavior for the design of information systems and the lack of in-depth study of information-seeking behavior of medical students, further exploration of this area is essential. The aim of the study was to examine the expression of behavioral intentions of information seeking among Sri Lankan medical undergraduates using the integrated behavioral model as the theoretical basis.

### **Objective of the Study**

Objectives of the study are to determine how attitude, perceived norms and personal agency affect the information seeking behavior of medical students; to determine how additional factors, knowledge and skills perform the behavior, salience of the behavior, environmental constraints, and habit affect the information seeking behavior of medical students; to determine whether the integrated behavioral model can be used to evaluate the information seeking behavior of medical students.

## **Methodology**

The study was conducted in the medical faculties of four universities in Sri Lanka; Universities of Colombo, Kelaniya, Peradeniya and Eastern University. The number of students entering under merit quota are proportionately larger than the number entering under district quota in Universities of Colombo and Peradeniya. Therefore, the study population is adequately diverse and representative, which will help enhance the generalizability of the findings of this study. Final year medical students were selected as their experience on information seeking throughout the course is richer than their junior colleagues.

As it was an exploration of experience, qualitative research approach was adopted (Carrasco & Lucas, 2015). Focus group discussions (FGD) were used as the method of data collection as they generate the expression of opinion of others and the issues discussed are not sensitive (Valentine, 1993; Thomas et al., 1995). The focus group discussion is more efficient and it requires less intellectual and emotional energy (Dilshad & Latif, 2013). The research participants of a focus group tend to interact with one another creating a forum for sharing experiences and providing a greater emphasis on their points of view (Greenwood, Ellmers, & Holley, 2014). This exploratory qualitative study was conducted in the medical faculties of four universities using focus group discussions that included 85 final year medical students. The discussions were guided but not limited by a pre-prepared interview guides. All focus group discussions were audio-recorded using a digital audio-recorder and transcribed verbatim. Socio-demographic information was obtained from each participant. The data was deductively analyzed using behavioral components of integrated behavioral model of information seeking behavior of medical undergraduates.

## Results and Discussion

The ratio of male to female students was 47: 38 and the average age of participants was 26.1(Range: 24 to 29). The study revealed that there are many personal attitudes of the medical students on information seeking behavior. The positive attitudes of the students are that studying in the library is very effective (*"I prefer to study in the library."*); information sources recommended by the lecturers are reliable (*"The information resources recommended by the lecturers are reliable."*). Some of the negative attitudes of the students are; librarian does not facilitate information seeking (*"I do not have the positive image for the librarian."*); lecture notes are adequate to gain the knowledge expected in the course (*"I believe that lecture notes are adequate for our studies."*).

In perceived norm, information seeking behavior of the medical students is affected by the social pressures to encourage the behavior e.g. demanding situations (*"If the consultants are not tough enough, we are not working well."*); facilitative situations (*"My friends encourage me when I am not working."*); or discourage the behavior e.g. loss of interest(*"We lose the interest when the lecturers read only the lecture note or speak continuously by looking at the presentation."*); stigmatization by friends (*"Some students who study alone are stigmatized by their friends."*).

Individual's capability to perform the behavior (Personal Agency) is positively influenced for seeking information e.g.: Preference for the electronic format in difficult situations (*"I use electronic format than printed format when I am so depressed."*); availability of time (*"I have pretty much time to search and read information."*). The students' effectiveness is negatively influenced in seeking information e.g.: feeling upset when they fail to find information (*"I am upset when I fail to find information."*); becoming

confused when they find contrasting information (*"I am confused when I get contrasting answers."*).

The study revealed that the information seeking of the students is positively affected by their skills and knowledge in seeking information e.g.: the reliability of information through Internet is basically determined by the students based on their knowledge on the reliability of websites (*"If it's a site of a university, we refer them."*), the awareness of the most updated edition of a textbook (*"Students are aware of the latest edition of textbooks in their discipline."*). Non-availability of skills and knowledge negatively influence information seeking behavior e.g.: not being aware of the inter-library loan facility (*"We do not know about the inter library loan facility."*) and limited knowledge and skills in advanced search techniques (*"I do not have an idea of advanced searching."*).

Salience of behavior positively affects seeking information of the medical students. e.g.: advantages of having additional information (*"Reading additional information is important in passing exam very well."*) and group discussions (*"Even though I prefer self-study, I think it is very effective doing group discussions especially for tutorials or for answering questions because others may have better answers."*).

Information seeking behavior of the students is influenced positively by availability of material (*"There are textbooks in some wards."*), the suitability of the place (*"I study at the hostel room. I feel free there."*) and negatively by dissatisfaction with the system (*"Students prefer using the library than the open areas, if not for the library rules."*) and the facilities (*"I am not satisfied with the facilities provided by the computer center."*) creating environmental constraints.



The information seeking behavior is affected by the habits of the students positively e.g. using the library in the hospital (*"I used to go to the library in the hospital."*); preparation prior to the lecture (*"Some students refer the lecture notes prior to the lecture."*), preference for certain times (*"I prefer to seek information early in the morning."*) and the use of mass media (*"There are quite a few friends of mine who have the habit of reading newspapers daily"*) in seeking information.

## Conclusion

All the components of the integrated behavioral model can be applied on information seeking behavior. The integrated behavioral model can be used to determine the information seeking behavior of the medical undergraduates successfully and the finding of the study will be useful to identify best practices and to inform information system design academic achievements. Future research should attempt to apply the integrated behavioral model to a variety of other information seekers such as schools' students, undergraduate and post graduate students in different disciplines, teachers, lecturers etc. to evaluate and to predict their information seeking behavior. This model can also be considered applying to other human voluntary behaviors.

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**ASSESSMENT OF INFORMATION AND LIBRARY USAGE  
DURING SECONDARY EDUCATION OF NEW ENTRANTS TO  
THE FACULTY OF MEDICINE UNIVERSITY OF PERADENIYA**

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**Keywords:** Information Literacy, Library usage, Library orientation, Medial undergraduates

**Introduction**

The students use various sources of information in their secondary education in order to prepare for examinations to enter the universities. They may find this information within the libraries or outside the libraries. Globally the secondary school education ends the formal school education and afterwards they start the tertiary education. During the primary and secondary education, the students are closely guided by teachers. But in tertiary education the students have to do a considerable amount of self-directed studies, find information for assignments, laboratory work, research projects etc., Therefore the university librarians conduct various training programmes to support the students to find information in print and electronic media.

Several studies have been conducted on the information gathering and library usage of new entrants. In a study conducted by Aldes et.al (2014) in Nigeria University of Science and Technology, the experience of school library usage positively influences the library usage of the undergraduates. According to a study conducted by Wijetunge and Gunsekera (2015) at University of Peradeniya, majority of the management students who use the

university libraries heavily have used the school libraries. However, they do not have experience in using computers to find information in libraries. Most of the information needs were fulfilled by handouts given at tuition classes, materials purchased from bookshops and borrowed from friends and relatives than from the school library. Another study conducted at the same university by Wijetunge and Alahakoon (2015) on the “Experience of school library usage as a planning for Information Literacy programmes: with special reference to new entrants of LLB programme” has concluded that the majority of students do not use magazines and also they have no experience in using a library catalogue or computers at the library. The majority of the students were willing to communicate digitally with the library. It was recommended to train the students to use the library catalogue and computer based information sources, and journals. A study conducted by Wijetunge and Manatunge (2015) on “Access to select social media and the preferences of communication methods with the library: A gender-based analysis of new entrants” has showed that the majority of the students were willing to communicate with the library using social media. Most of the students were willing to receive SMS from the library. It was recommended to use the preferences of the students in providing library services and planning Information Literacy programmes.

The new entrants to the Faculty of Medicine begin their tertiary education after completing the secondary education. Therefore, their information needs and library usage has to be studied in order to plan the library orientation and other information literacy programmes at the universities.

The Medical Library conducts the library orientation for the new entrants during the Intensive Course in English before starting the academic

year. The library also conducts an information literacy course during the first semester of their 1<sup>st</sup> year.

### **Aim of the Study**

The aim of the study is to find out the information gathering patterns and the library usage of new entrants to the Faculty of medicine in order to deliver library services and training programmes effectively.

### **Objectives of the Study**

The general objective of the study was to analyze the information gathering patterns and library usage of new entrants to the Faculty of Medicine.

The specific objectives of the study are;

1. To identify the information gathering patterns of the new entrants
2. To study the library usage of the new entrants
3. To find out the contents to be considered in formulating the library training programmes for first year medical undergraduates.

### **Methodology**

The total population of the study was 212. All new entrants were selected as the study population. A structured questionnaire was used to collect data. The questionnaire was distributed to the students before the library orientation programme. The results were entered into Microsoft Excel package. Descriptive statistical methods were used to analyze the results.

The questionnaire was designed to gather their socio demographic information, information gathering before entering the university, library

usage during their school days and the usage of Internet for their academic work as well as for entertainment.

## **Results and Discussion**

### ***Socio-Demographic Data***

In this study, 202 students have responded the questionnaire. The response rate was 95.28 %. Out of the 202 respondents 96 were males and 106 were female students. More than 60% of the students were above 20 years.

### ***Information Gathering Patterns***

The students were asked to select the information sources that they used to study for their Advanced Level (A/L) examination.

**Table 1: Information sources used by the new entrants to study for their A/L**

<b>Information Sources</b>	<b>Number</b>	<b>%</b>
School notes	195	96.50%
Tuition notes	198	98.01%
Text books	160	79.20%
Past papers	201	99.50%
TV lessons	24	11.88%
Lessons in Internet	61	30.19%
Magazines/ newspapers	55	27.22%

Majority of the students have used past question papers (96.5%). Next highest was the notes given in tuition classes (98.01%) and notes given by the school teachers (96.5%). They have also used a considerable amount of text books (79.20%). Less than 50% students have used lessons downloaded from Internet, TV lessons and magazines and newspapers.

The students were asked to mention the other sources of information which were not in the list and they were model examination papers, term test papers of other schools, short notes and small group discussions.

The next question was to examine who recommend the information resources to the students. 80.69 % students have responded that the teachers recommended them. 44.50% have mentioned that either classmates or him/herself have selected the resources. 40.09 % have stated that elder brothers/sisters recommended them. Only 18.8% have stated that they selected the resources as they were written by competent authors.

### ***Usage of Internet***

The students were asked whether they have used the Internet. 198 students (98%) use the Internet. The next question was about the purpose of using Internet. Overall Internet usage of Medical undergraduates is high. Most of the students use the Internet for educational purposes (Table 2).

**Table 2: Purpose of using Internet**

<b>Purpose</b>	<b>Number</b>	<b>%</b>
To find information on subjects	178	88.11%
To use e-mail	130	64.35%
To use social media like Facebook twitter etc.,	161	79.70%
To play games/ watch movies	135	66.83%

### ***Usage of the Library***

The students were asked whether they used libraries. Majority of the students (71.78%) have used libraries. The next question was about the type of libraries they used. School libraries have been used by 135 (66.83%) students and 47 (23.26%) students have used public libraries. Only two students have used the British Council library. The students mainly depend on schools and libraries in the vicinity to find information.



The students were questioned about the way of finding the book in the library. Majority of the students look for books by going through the book shelves in the library. The usage of computerized catalogue is very low. The other methods of finding books in the library is to get the help of teachers (Table 3).

**Table 3: Method of finding books in the library**

Method	Number	%
Card catalogue	43	21.28%
Computerized catalogue	3	1.48%
Going through the book shelves	94	46.53%
Get the Assistance of the Library staff	39	19.30%
Getting help from friends	54	26.73%

### **Conclusions and Recommendations**

The students mainly use information resources recommended by teachers than selecting on their own. The students have used lot of examination and various kinds of past papers to prepare for the examinations. This shows that their main aim of information gathering is to face the examination successfully than gaining knowledge on their subjects. However, the students have used text books too. But 18.8 % of them are not very familiar with the credibility of the authors in selecting information sources.

Most of the students have used their school libraries but only few have used a card catalogue or computerized catalogue to find books. This was emphasized in another previous study conducted by Witunge and Alahakoon (2015) for new entrants in LLB programme.

Students do not seek the help of the library staff to find information in the library. They need to be encouraged to get the support from the library staff to find information in the library unlike during their secondary education

period. The Internet usage is very high. The students have already used Internet for educational purposes during their secondary education.

A formal library orientation is very important for the medical undergraduates which could be useful for their lifelong learning carriers. Finding their own information using the computerized catalogue has to be included in the library training programmes. It is recommended to have a hands on session to use the library catalogue. This will help them to use the Medical Library effectively during their undergraduate carrier.

Although the students depend on their teachers during their secondary education period, they should be more independent in finding credible information resources for their academic work during their tertiary education and afterwards. As they are taught to find information from various printed and electronic resources specially from Internet, it is important to include evaluation of information session to the curriculum. This also supports the for the result that show the awareness of students about the credibility of the author is low. It is very important for medical students to use scholarly information during their undergraduate period as well as after graduation.

As the students have a good IT background and familiar with using Internet, prior training to use computers and Internet is not essential. The use of databases and searching techniques could be easily taught. As the IT literacy of new entrants is high, online training courses and e-learning also could be incorporated with the normal information literacy programmes.

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**ASSESSING COMPUTER LITERACY OF FIRST YEAR  
UNDERGRADUATES: A PRELIMINARY SURVEY AT EASTERN  
UNIVERSITY OF SRI LANKA**

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**Key Words:** Computer literacy, Information Retrieval Skills, Information, Undergraduates, Academic library, Library orientation

**Introduction**

Computer literacy could be defined as the knowledge and ability to use computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving (Ikolo & Okiy, 2012). Oviawe and Oshio (2011) stated that ICT facilities serve as a major contributor to effective teaching and learning and computer literacy may improve the knowledge and ability of students for higher academic performance.

Nowadays, undergraduates confront new challenges which are vital to their survival in the information age (Ikolo & Okiy, 2012). The contemporary information world offers variety of information choices which lead to information overload. Explosion of information on Internet with billions of websites are complicating the access and retrieval of information by the users. In this juncture, it is important that undergraduates should have excellent online searching skills to access information in an efficient and effective way.

Academic Libraries play a major role in identifying computer literacy and information retrieval skills of undergraduates as libraries have been

established in support of the core mission of their parent institutions to support in aid of teaching, learning and research activities of faculties and students. Dhiman (2006) stated that Libraries and Information Centers have responded by acquiring information technology and encouraging computer literacy.

Library Orientation programmes not only help to provide information on library and information sources but also helps to identify the computer literacy and information retrieval skills among undergraduates as it is an emergent need for medical and non-medical students in the third millennium due to rapidly changing information society.

Further, university libraries are striving to be fully automated and every task of library is accomplished by use of computer. In order to derive benefit from the electronic library environment, the undergraduates need to be computer literate. Therefore, this preliminary survey was intended to find out the level of computer literacy among the first year undergraduates and to initiate user education programme in future. Moreover, this would help the faculty to engage in computer literacy programmes that will address the needs of incoming students.

### **Objectives of the Study**

- To identify the needs of first year undergraduates regarding computer applications
- To examine the computer literacy of the freshmen
- To identify role of library for the enhancement of computer literacy of undergraduates

## **Methodology**

The study targeted all first year undergraduates at Faculty of Health-care Sciences, Eastern University of Sri Lanka for the academic year 2018/2019. Total population of the study was 105. All 105 freshmen were included in the study. Self-administered questionnaires were distributed among 81 medical and 24 nursing students. The response rate was 100%. The descriptive statistics was used to analyze the data with the aid of the SPSS statistical software package.

## **Results and Discussion**

### ***Demographic Profile***

Among the respondents, 40% were male and 60% were female. Regarding the demographic characteristics of the population, it was observed that most of the incoming students were from Ampara and Batticaloa districts. Among these 46.5% of the students were from urban and 53.5% of the students were from rural municipalities.

### ***How did they learn to use computers?***

The undergraduates were asked to select the method that they learned to use computers. The results revealed that more than fifty percent (55.2%) of the students acquired computer knowledge through self-learning. 44.8% of them learnt through peer learning. However, only 40% of the students have gained computer knowledge from school level (Table 1). Similarly, Ajayi (2013) reported that the majority of students in teaching hospital in Nigeria acquired computer skills through self-education, learning from friends, and practicing on their own. Although the self-learning is appreciated, getting a formal training is essential to master on the particular skill.

**Table 1: How did they learn to use computer?**

<b>Methods of learning to use computers</b>	<b>Percentage (%)</b>
Self-study (reading books/articles, tutorials, etc.)	55.2%
Family, friend, or colleague	44.8%
School	40.0%
Computer course	36.2%

***Cross tabulation between Municipality and who follow IT courses***

Around 58% of students who live in urban area, have followed IT courses while 40% of the respondent who live in rural area have followed the same. It seems that the students in urban area have more opportunity to attend courses when compared to students in rural.

***Computer programmes that student able to use***

89.5% and 72.4% of the students have competencies in Microsoft Word and Power Point respectively. However, only a few students have used computers for more advanced functions such as such as Microsoft Access (26.7%), Photoshop (21%) and programming languages (14.3%) (Table 2). Ranasinghe, Wickramasinghe, Pieris, Karunathilake, and Constantine (2012) stated that the undergraduate students used computers for predominately Word processing, Entertainment, Web browsing and preparing presentations.

**Table 2: Computer programmes that students able to use**

<b>Computer Programmes</b>	<b>Percentage (%)</b>
Microsoft Word	89.5%
PowerPoint	72.4%
Excel	60.0%
Microsoft Access	26.7%
Photoshop	21.0%
Programming Languages	14.3%

### ***Ability to use Internet***

Most of the students were using Internet facilities, which were mainly accessed using mobile devices. All students had their own e-mail address which is 99%. When it is considered the Internet skills, only 45.7% of the respondents have good knowledge on this criterion. Therefore, there is a need to improve the Internet skills of the first-year undergraduates. Moreover, the findings stated that there is no difference in Internet skills between gender and municipality. Frequent use of computers and the Internet is indicative of achieving competency in computer literacy (Gibbs & Zealand, 2008) and boosting of self- confidence and comfort level in using computer systems.

### ***Online searching skills***

As given in table 4, it was observed that highest percentage of participants remarked their online searching skills at a 'Good' level. Chi-Square test was performed to test the relationship between municipality and online searching skills. The results revealed that there was a significant association between municipality and online searching skills of undergraduates. ( $\chi^2$ - 8.060, df-4,  $p<0.05$ ). Around 56% of the students are good at online searching skills. When the cross tabulation was performed between municipality and online searching skills, findings revealed that 68.1% of the students who live in urban area have good knowledge, 48.1% of the students live in rural area have the same. Only 15% of males and 7.9% of females having excellent online searching skills (Table 3).

The ability to use computer to search and retrieve information effectively becomes an essential skill of the undergraduates as well as enabling the positive and successful use of the electronic resources in the University. Even though, the undergraduates are able to find out the information sources for their study and research, they are not in a position to form the search



strategies, which are necessary to make the relevant searches. Kumar and Mahajan (2013) pointed out that students were not confident in searching information from electronic resources and also are not fully computer literate to an extent that they are able to retrieve academic information from electronic resources and databases. It is the duty of existing libraries to equip students with the necessary information skills to function effectively and to meet challenges of the information age.

**Table 3: Online searching skills**

Online Searching Skill	Percentage (%)
Very Poor	1.0%
Poor	3.8%
Moderate	28.6%
Good	56.2%
Excellent	10.5%

***Level of computer literacy***

The computer literacy of the first year under graduates was evaluated by testing four parameters such as how they acquired knowledge to use computer, computer programmes that they are able to use, ability to use Internet and online searching skills of the undergraduates. The study resulted that 52.4% of students had satisfactory level of computer literacy while 21.9% of them had good level. In this juncture, the faculty should take proper action to improve their computer literacy to a great extent. Lack of computer skills is an issue which can hold back many of the pedagogical opportunities that students can exploit to assist in their medical sciences teaching (Murray & Blyth, 2011).

**Table 4: Level of computer literacy**

Level of Computer Literacy	Frequency of Students
Below average	14 (13.3%)
Satisfactory	55(52.4%)
Good	23 (21.9%)
Excellent	13(12.4%)

## **Conclusion**

In general, students have sufficient knowledge on computer applications such as Microsoft Word and Excel regardless of gender. The results revealed that more than fifty percent (55.2%) of the students acquired computer knowledge through self-learning. Almost all the undergraduates had e-mail accounts. Less than fifty percent (45.7%) of the participants remarked that their Internet skills are at 'Good' level. The findings provide evidence that the faculty should concentrate more on improving the online searching skills of the undergraduates specially of those who come from rural municipality. However, finding stated that only 21.9% of undergraduates had good level of computer literacy. Therefore, there is a need to improve computer literacy of students with lack of knowledge on use of computer. This could be done by increasing computer training and support programme for these students at the initial stages of the undergraduate programme. This requires improvement in infrastructure and other resources. The library has a great role to play in the provision of resources necessary for their learning. These findings would help to make decisions when purchasing materials for library.

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## **APPLICATION OF QUEUEING THEORY TO LIBRARY MANAGEMENT SYSTEMS WITH SPECIAL REFERENCE TO OPAC SEARCHING**

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**Keywords:** Library management systems, Queueing theory, Performance measures

### **Introduction**

Queueing theory is an essential mathematical tool for analyzing diverse problems of congestion in many fields such as computer and communication systems, service systems, telecommunication systems, and traffic systems, as these can be designed as queueing systems using the basic concepts of queueing theory. Shanmugasundaram and Umarani (2015) stated that “scope of queueing application in libraries are circulation of books, counter service, and allied services like reprography”. However, applications of queueing theory can be practically extended to Library Management Systems as well and analyzing the queueing systems in libraries which will be helpful to improve the efficiency of the services offered by Libraries. As the application of queueing theory to libraries, the following example for circulation of books can be considered.

A reader who wants to check-in or check-out a book always arrives randomly to the circulation counter, and the user requires immediate service available at that time. If the circulation counter is busy when user arrives, the user should wait for services and join a waiting line with patience. Therefore,

according to the difference between the reader's arrival rate and the service time, a queue, in which he/she waits to be served, is formed in front of the circulation counter. In real life situations, it is hard to give a prediction exactly when a reader will be at the circulation counter and how much time will be taken to complete the service. Therefore, in this case, queueing theory can be applied to reduce the waiting time of readers for this service.

The first attempt to examine library performance using queueing theory was done by Morse (1968) and he discussed how to model book circulation in academic libraries by using queueing theory. Warwick (1994) introduced a new queueing model that evaluates the consequence of the loan period, policy for a duplication process and readers' borrowing capacity on the circulation of recommended readings in an academic library. A simple queueing theory was applied by Warwick (1998) to describe the circulation and reservation processes. Acharaya and Ravidran (1999) discussed the application of queueing theory for library and information fields. Recently, Somvanshi and et al. (2012) studied how to solve some problems arisen in the areas such as circulation of books, counter service, and allied services, etc. by using queueing theory.

It can be noticed that no one has tried to discuss the use of queueing theory to LMS with special reference to OPAC searching. Therefore, in this research, an application of queueing theory to LMS with special reference to OPAC searching was studied and the results of this study will help to improve services offered by Libraries as online services.

## **Scope of Queueing Theory Application in Libraries and Information Centers**

Queueing theory can be applied to evaluate the following services provided by libraries

- Circulation of books
- Counter service (Information Space Counters, Reference Help Desks, etc.)
- Online services provided by libraries

## **Characteristics of a Queueing Model**

Since many random variables are used in a queueing system, David G Kendall (1961) has introduced a shorthand notation system to categorize them and describe them succinctly in a mathematical short form. It is expressed by  $A/B/C/X/Y/Z$ , where

- A indicates the inter-arrival time distribution,
- B indicates the service time distribution,
- C indicates the number of servers,
- X indicates the system capacity (System may be a person, a machine or both according to queueing system),
- Y indicates the size of the customer population, and
- Z indicates the queue scheduling discipline.

First three parameters are sufficient to represent a queueing system. For example, if the arrival process is a Markovian (Poisson) process and service process follows a Markovian (exponential) process and the system has a single server, the system can be denoted as an  $M/M/1$  queue. When the system capacity and population size are infinite (for large population) and the

scheduling discipline is FCFS (First Come First Serve), the letters for them might be omitted. Thus the  $M/M/1$  queue gives unlimited space for the arrivals and population size is infinite.

### ***Little's Law***

Little's law was first introduced in a formal way by J. D. C. Little (1961) to solve problems in a queueing system. It says that the number of customers in a system is equal to the product of the effective arrival rate and the time spend in the system and this law is expressed as follows,

$$L = \lambda W$$

where

$L$  - the mean number of customers in the system

$\lambda$  - the arrival rate

$\mu$  - the service rate

$W$  - the total time spent in the queue and at the server

The most important characteristic of Little's law is that it may be applied individually to the server or the queue to derive the expressions.

Let's define

$L_q$  - the average number of customers waiting in the queue

$L_s$  - the average number of customers receiving service

$W_q$  - the average time spent in the queue

$W_s$  - the average time spent receiving service

Then

$$L_q = \lambda W_q$$

and

$$L_s = \lambda W_s$$

where

$$W_q = \lambda / \mu (\mu - \lambda)$$

$$L_q = \lambda^2 / \mu (\mu - \lambda)$$

For the queueing system to be stable,  $\lambda / \mu$  (system utilization =  $\rho$ ) must be less than 1.

### **Methodology of Application**

Assumed data on arrival rate and service time to be fitted standard statistical distributions are used to discuss the proposed problem.  $\rho$ ,  $W_q$  and  $L_q$  will be evaluated to check whether these indices are within the specified performance measures or not. If they are within the specified performance measures, this system is stable. If not, the system should be upgraded according to service requirements.

### **Illustration**

#### ***Library Management System Example***

Suppose that a library has a single server for the Online Public Access Catalogue (OPAC) and customers search the library resources for their needs using this system. Queries sent by customers can be referred to the customers. It is assumed that the probability distribution of the inter-arrival time and the service time have an exponential distribution, and the number of arriving patients per unit of time follows the Poisson distribution. The scheduling discipline is FCFS and capacity of the system is infinite. Then, this system can be modeled as an M/M/1 queue.

It is assumed that the service time of the processor of the OPAC server is exponentially distributed with mean  $\mu = 2000$  customers/ms. The arrival



rate of customers at the processor of the OPAC server follows a Poisson process with rate  $\lambda = 1400$  customers/ms (ms - milliseconds.)

### ***Calculation of the Performance Measures***

$$\rho = \frac{\lambda}{\mu} = \frac{1400}{2000} = 0.7 < 1$$

The result says that ‘Traffic’ is in control. It means that the queueing system is stable.

$$W_q = \lambda / \mu (\mu - \lambda) = 1400 / 2000 (2000 - 1400) = 11.67 \times 10^{-3} \text{ ms}$$

It shows that a customer spends  $11.67 \times 10^{-3}$  ms in the queue to complete the service requirements.

$$L_q = \lambda^2 / \mu (\mu - \lambda) = 1400^2 / 2000 (2000 - 1400) = 1.63 \approx 2$$

Two customers wait approximately in the queue to fulfill their service requirements.

If the arrival rate of customers increases up to  $\lambda = 3500$  customers/ms,

$$\rho = \frac{\lambda}{\mu} = \frac{3500}{2000} = 1.75 > 1$$

It means that the queueing system is unstable. Therefore, to run the system efficiently, the traffic should be in control. To achieve this requirement, the value of  $\rho$  must be less than 1.

Take the maximum value for  $\rho$  as 0.99.

Then

$$\rho = \lambda / \mu$$

$$0.99 = 3500 / \mu$$

$$\mu = 3535.35354 \approx 3536 \text{ Customers/ms}$$

Therefore, the service rate of the processor must be greater than or equal to 3536 customers/ms if the system is stable.

It suggests that when a server is selected to establish the OPAC system, the performance of the processor should be compatible with the service requirements of customers.

## **Conclusion**

Queueing systems are successfully used to analyze the performance of different functions in libraries and information centers such as circulation of books, counter service, etc. To explain it properly, queueing theory application for Library Management Systems is given as an example. The results show that if the indices ( $\rho$ ,  $Wq$  and  $Lq$ ) are within the specified performance measures, this system is stable. If not, the system becomes unstable and it should be reassigned according to the system requirements.

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## **JOB SATISFACTION OF UNIVERSITY LIBRARY STAFF IN THE WESTERN PROVINCE, SRI LANKA**

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### **Introduction**

Satisfaction of one's own job is very much important to any employee in an organization. Also it is a key component for enhancing the productivity of the organization and as well as the career development and prospects of the employees. Theoretically, the topic of job satisfaction is considered as one of the widely and frequently disused topics in organization behavior studies due to its inherent nature. Different researchers have defined the concept of employee 'job satisfaction' in different ways. It is simply recognized as a perception of employees towards their own job and correlated aspects and how they evaluate their job satisfaction or dissatisfaction.

Universities have been established as higher educational institutions or centers for sharing knowledge, conducting innovative researches, and engaging in the community development activities. In this circumstance, academic library plays a key role as a core unit of a university and as a center of academic life. The support given by the library staff is very important for

the smooth functioning of the system. Delivering an effective and productive library and information service to the patrons completely depends on the library staff and such a service is easy to render when the library staff is satisfied with their jobs. This present situation created a very good opportunity for researchers to conduct studies on job satisfaction levels of staff members serving in university libraries.

Measuring the levels of job satisfaction of employees is complex in nature. A number of attempts have been taken to define and measure the inborn nature of job satisfaction of university library staff both locally and internationally. Alansari (2011) described job satisfaction with career choice and perception of general public by using the consent of 117 librarians working in public, special type and academic libraries in Kuwait. According to the findings of this study, respondents were in the stage of slight satisfaction with their career. Study further recommended to improve career image of the librarians in Kuwait. Omeluzor, Tinuoge and Akpojotor (2016) conducted a study based on university libraries in Nigeria. They have identified five main factors for the level of satisfaction about their jobs as physical working environment, salary levels, fairness, training and promotions. This study revealed that these factors act as stimulus to deliver a productive and quality library and information service to the user communities in universities.

In Sri Lanka, few studies have been carried to explore the job satisfaction of university library staff and all these studies were mainly focused on professional staff only. The first attempt to discuss about job satisfaction of university library staff was done by Thirunavukarasu in 1994. This case study was limited to fifty professionals in ten universities and level of job satisfaction was measured by using motivation and hygiene factors. Marasinghe and Wijeratne (2016) evaluated the job satisfaction of hundred

and twenty-three library professionals in three generations: Baby Boomers, Generation X and Generation Y. They have used co-workers, compensations, supervision and promotions as parameters in the study. Study results identified that job satisfaction changes with the generation and in the case of parameters such as 'work' and 'supervision', baby boomers were much satisfied with their work than the others. Generation Y had shown a higher level of satisfaction than others. Punyawardene in the same year investigated the impact of six factors in the context of job satisfaction of 285 library assistants in 13 university libraries in Sri Lanka. Factors such as salary, overtime earning, loan facilities, welfare, accommodation, leave to go abroad and career development were selected as the study variables in this research. Salary was identified as the most influential factor in this study and they were dissatisfied with other job facets tested in the study. Study recommended to enhance welfare facilities and career development opportunities for library assistants in university libraries in Sri Lanka.

In the local context most of the job satisfaction related studies were forced on the professional staff. Therefore, this study was conducted to comprehensively investigate the level of job satisfaction of staff members representing all the job categories in university libraries located in the Western province, Sri Lanka. When compared to other provinces, Western province has the highest number of universities and based on this fact, the Western province was selected for this study. Additionally, the research objectives were focused on identifying the main factors related to job satisfaction of employees in different universities and finally to provide suggestions to overcome the dissatisfaction level of jobs in respective universities.

## **Methodology**

There are six universities located in the Western province of Sri Lanka. However, this study was limited to five universities. As a result of not receiving the ethical clearance permission during the survey period, one university had to be left out from the study sample. The total number of study population was 225. Based on the study purposes all 225 staff members attached to all five university libraries were selected as the study sample. A survey questionnaire was used to obtain data. It was designed in four parts to obtain demographic information of respondents, factors related to job satisfaction and staff perception of their level of job satisfaction. Five point Likert scale ranging from 1-5 (Strongly Disagree, Disagree, Neither agree nor disagree, Agree and Strongly agree) was used as the type of scale in the questionnaire. The return questionnaire response rate was 80% and 180 questionnaires were taken into the final analysis. Reliability of the questionnaire was tested by using Cronbach's alpha test and alpha values which indicates 0.892 (31 items). Collected data were analyzed using factor analysis, frequency and descriptive statistically analyzing techniques in the Statistical Package for Social Science (SPSS) version 22 for windows.

## **Results and Discussion**

Gender distribution of the sample consisted with 49.4% males and 50.6% of the female. 33.9% represented the age group between 31-40 years and extensive percentage (50%) of staff members had working experience of between 1-10 years. The first research objective of this study was to explore the level of job satisfaction of employees. Research findings revealed that there is no significant difference of job satisfaction of employees among universities. According to the table 1, the library staff of University of Sri

Jayewardanapura (3.87) showed high level of overall job satisfaction compared to other universities. Based on the survey result, overall mean value 3.72 signify that the university library employees in the Western province, Sri Lanka were moderately satisfied with their jobs in libraries. The 27 items related to factors of job satisfaction were categorized into seven factors to identify the main factors related to context of job satisfaction of respondents. According to the results, 'salary and benefits', 'physical working conditions', 'co-workers', 'career development opportunities', 'work itself', 'cooperation' and 'appreciation and feedback' were identified as the factors related to job satisfaction of library employees serving in university libraries in the Western province. The highest mean value which is 3.82 was recorded for the item 'I find my work is interesting'. The second highest mean value (3.74) recorded for the item 'I Like people I work with'. Additionally, 'I feel that my work place is a safe environment' also received the relatively high mean value of 3.72. More than 65% employees in the library of Open University are highly satisfied with above mentioned factors of job satisfaction. However, level of satisfaction on 'salary and benefits', 'physical working conditions' and 'career development opportunities' are in lower level in all universities. Findings also revealed that there is a significant difference in the level of satisfaction on 'work itself', 'cooperation' and 'appreciation and feedback' among the library staff in universities in the western province.

**Table 1: Overall job satisfaction of staff by Universities**

	<b>Name of the University</b>	<b>Mean</b>
01	University of Sri Jayawardanapura	3.87
02	University of Kelaniya	3.68
03	University of Moratuwa	3.63
04	Open University of Sri Lanka	3.66
05	University of Visual and Performing Arts	3.61



## **Conclusion**

Based on the survey findings, the study concluded that the employees working in the university libraries in the Western province were moderately satisfied with their jobs. It is a positive indication that the staff members are not dissatisfied with their jobs. However, university authorities and library administrations must take initiatives and measures to enhance the present level of job satisfaction of employees to the fully satisfied level. The study further identified that lack of cooperation between workers, inadequate opportunities for career development and lack of proper mechanism for appreciation and feedback led to staff dissatisfaction with their jobs. Therefore, this study recommends to establish a collaborative working atmosphere within the library by organizing team building activities, job rotation programmes immediately. Finally, the immediate attention must be drawn to set up a proper method to provide feedback and evaluate the performance of employees to make them more satisfied and committed to their work in university libraries.

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**THE ROLE OF A UNIVERSITY LIBRARY IN DEVELOPING  
INFORMATION SEARCHING SKILLS OF USERS: A CASE STUDY  
OF UNIVERSITY OF KELANIYA**

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**Keywords:** Information searching, Academic libraries, University students,  
Library users

**Introduction**

The role of the library is fundamentally contingent upon the educational objectives as well as the vision and mission of the institution and mainly the type of users attached to the institution (Allen, 1982). University libraries are identified as academic libraries and mainly focus in supporting the teaching, learning process and fulfillment of the information needs and research needs of the undergraduates and academic staff. Over and above, the main role of the university library is to support to achieve vision, mission and accomplish the goals of the institute. The university library is the heart of the university, that indicates the prominence of the library for the university. However, the role of the university library spread broadly among the undergraduates, academic and non-academic staff and directly connect with the learning and teaching process. Besides, the university library has to play a big role in developing literacy skills of undergraduates attached to the relevant universities. Providing information literacy (IL), education on data literacy, providing research data services, making awareness among faculty members on different issues and providing individual support for both staff members

and students are the main roles of the academic libraries in supporting research (Koltay, 2016). On an account of Koltay (2016), there are many tasks to do as the academic libraries.

At the present, information has become an integral part of the people. However, the way of information searching differs from person to person on their information needs and the background. Any kind of profession uses various types of information sources to search information such as, library, personal collections, book stores, discussions, conversations, consultation, meeting, seminars, conferences, workshops and IT based sources etc. Not only professions, students also need to find information for preparing lecture notes, updating knowledge, preparing answers for questions, reading, thinking purposes, research works, observations and experiments, discussions and preparing for presentations. But their information seeking behavior is different. So that, there is a great need for the development of resources in the libraries and it is better to introduce awareness programmes for students to support in finding information more accurately in higher education institutes, mostly academic libraries in Sri Lanka. This research was conducted based on the problem as to what extent an academic library supports students in developing information searching skills.

### **Objectives of the Study**

This study mainly focuses on the library role of the University of Kelaniya in developing information searching skills of the users. This study was conducted mainly based on four objectives. The main objective of the study is to identify the role of the university library in developing the information searching skills. The other objectives are to identify the present information searching skills of university students at the University of Kelaniya, to evaluate what kind of programmes are organized by the library in

developing the information searching skills and to recognize the problems and shortcomings of the programmes which adapted to develop the information searching skills. This study mainly signifies the universities for identifying their lack of awareness programmes regarding the development of searching skills, available library materials and get more feedback related to the services of the library.

## **Methodology**

This is a mixed qualitative and quantitative research. The primary data for this study was collected through a structured questionnaire related to main key area of information gathering, role of the university and information searching skills of undergraduates. Also, interviews with sample users (100) were conducted to collect primary data for the study. Random sample method was used to select the sample. On an account of random stratified sampling method according to the Krejcie and Morgan, 368 questionnaires were distributed among university students who were in first year, second year, third year, fourth year of Commerce and Management Studies (92), Humanities (72), Science (70) and Social Sciences (134) faculties. The population of the study was 8,511 undergraduates from University of Kelaniya. Collected data were analyzed using IBM SPSS 22, data analyzing package to accomplish the research objectives of this study.

## **Results and Discussion**

After analyzing collected data from the undergraduates, results revealed that most of the undergraduates at University of Kelaniya visit the library whenever they need information for their studies. Updating the knowledge, research purposes, discussion purposes and other professional needs were highlighted as second priority. According to the results, the

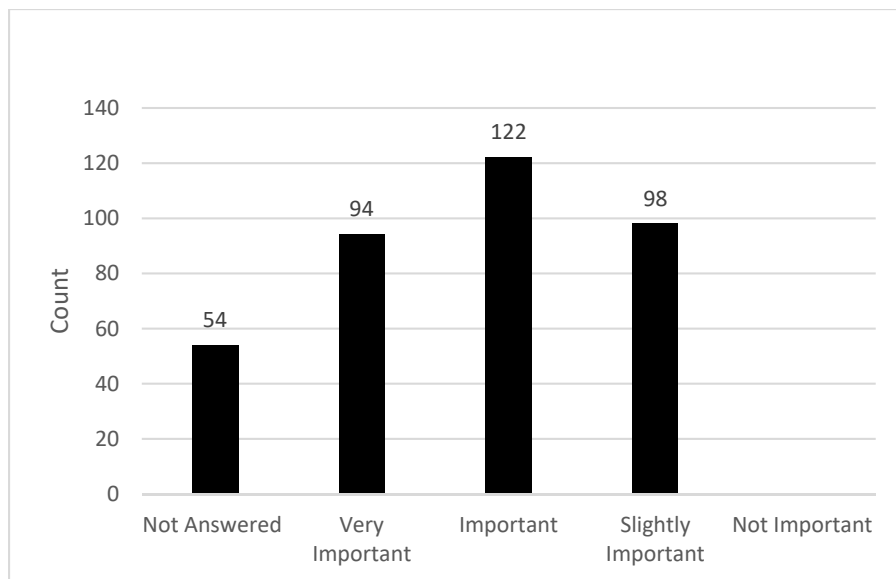
majority of undergraduates (45%) find their information from the library in the subject areas that they follow their degree programme. On the other hand, 34% of students search books from the library by using OPAC. In addition to that, 52% of students use both library and the Internet to gather information and Google is the most popular search engine (97%) among undergraduates who use the Internet for gathering information related to the studies. However, the lack of knowledge regarding information searching skills was identified as the main reason for the low performance of the students according to the results of this survey.

**Table 1: Searching awareness of undergraduates**

	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not Answered	17	3.9	4.6	4.6
Self-Study	176	40.0	47.8	52.4
From depart.	71	16.1	19.3	71.7
Lib. program	26	5.9	7.1	78.8
Lectures	21	4.8	5.7	84.5
Friends	57	13.0	15.5	100.0
<b>Total</b>	<b>368</b>	<b>83.6</b>	<b>100.0</b>	

According to table 1, the majority of undergraduates (47%) obtain the knowledge related to searching skills by self-studying. Library orientation programs or other information literacy programs are not popular among students as a knowledge sharing methods. Very fewer students (6%) believe that library programs are supportive to develop searching skills. On an account of the study sample, 71% of undergraduates have not participated in the library orientation programs because of their busy time tables. They gather information related to their subject areas by searching the book shelves (45%) and accessing the Online Public Access Catalogue (33%).

Finally, the majority of undergraduates (33%) highlighted that library awareness programs are important and 25% undergraduates commended that these programmes are very important to develop their searching skills to browse the Internet. It is crystal clear that the majority of undergraduates in the university depend on the Internet based information sources and they are not aware of library resources and the services provided by the library.



**Figure 1: Importance of library awareness programme**

## **Conclusion**

The researcher aimed to bring the results of this study to highlight the role of the university library in developing searching skills of undergraduates. Due to lack of library and faculty collaboration, it has become a difficult task for the library of University of Kelaniya to play an outstanding role in developing searching skills of information. The library provides several programmes for users and the majority of undergraduates do not participate to these programmes because of unawareness and busy schedules of their degree programmes. Although the orientation programme should be compulsory for

all undergraduates of the university, most of the students in this technological era believe that most valuable information sources are available on the Internet than in the library. However, all the faculties and the authority of the university should support the library to fulfill all responsibilities for undergraduates as an academic library. In Hong Kong, university libraries provide an "Online resource guide" on the library website including writing essays, reports and research paper writing and information related to research with the main purpose of helping young researchers and Ph.D. students (Fan, 2005). Further Fan mentioned that university libraries should play a significant role in supporting research work as the main role of the university libraries (Fan, 2005).

According to the above findings, the researcher recommended the following suggestions to improve the quality of university of Kelaniya. As of today, most of the librarians play their role as an information specialist and they try to support users in dissemination and publishing research findings of the research as well as improving the ability of students' searching skills in the literature review process (Ginther, Lackner & Kaier, 2017). As an academic library, librarians should follow the above matters to encourage their students for using the library as their main information source. Implementing more powerful library awareness and orientation programs, providing more publicity for these programmes, making these programmes as compulsory course units for the undergraduates are some suggestions for improvement of the role of university libraries in developing searching skills of undergraduates.



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## **DOCUMENTATION ASPECTS IN SRI LANKAN TAMIL SOUVENIRS**

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Souvenirs

### **Introduction**

Souvenirs are category of ephemera consisting of objects usually closely associated with a particular place, occasion, or person, frequently mass-produced and of negligible monetary value, often acquired as mementos. The word ‘souvenir’ is actually a French word meaning remembrance or memory. Lowenthal (1985) has explained the value of souvenirs as “although people are normally aware that the actual past is irrecoverable, memory and history, relic and replica leave impressions so vivid, so tantalizingly, that we cannot help but feel deprived. This discontent takes many forms: treasuring of antiques and souvenirs”. Souvenirs are also referred to as keepsakes or mementos and can be any item that somebody keeps for the memories it brings back. Souvenirs differ from Festschrifts, a memorial publication, usually in the form of a collection of essays or speeches by distinguished persons, issued in honor of a scholarly person or society, sometimes on the occasion of an anniversary, birthday, or

retirement celebration (Reitz, 2019). Tamil souvenirs generally fall into different types, a souvenir of an organization, a souvenir of a place, a souvenir of a person, or a souvenir of an event. These types sometimes overlap, and all aspects are considered intrinsic to the narrative of the object. Tamil's souvenirs have some reference value, even though they are published as evidence of the experience as well as the roles of memory and as gifts.

Paul Otlet was the most central figure in the development of documentation. He coined the term documentation. Otlet (1934) first adopted the word documentation, in an article titled "Les sciences bibliographiques e la documentation". Ranganathan (1963) defined documentation as "complex of processes involved in pin-pointed, complete and prompt series of emerging thought to specialist". It involves work of both compilation and editing. Also it refers to a collection of documents pertaining to a specific subject, especially when used to substantiate a point of fact. Accordingly, these types of works are considered as documentation works in this study.

### **Problem statement**

This exploratory study intends to overcome past research negligence on the role of souvenirs by identifying remarkable documentation aspects in Sri Lankan Tamil souvenirs.

### **Objective of the study**

Objective of this study is to identify the documentation aspects in Sri Lankan Tamil souvenirs.

## **Methodology**

This study is conducted using mixed method which combines descriptive and exploratory research approaches together. Datasheets used for the collection of quantitative and qualitative data. Different types of 100 souvenir works such as a souvenir of an organization, place, person, or an event have been selected from the Library University of Jaffna on structured random sampling method for this study. Despite its limitations, this study explores the identified documentation aspects in Sri Lankan Tamil Souvenirs with the analysis.

## **Results and Discussion**

The present study identified that variety of information has been documented in souvenirs. It is also identified that it has the added benefit of having some sort of sentimental value. Further this study revealed remarkable documentation aspects in Sri Lankan Tamil souvenirs such as documenting geographical information of selected area, biographical sketch that structured to highlight an important individual, chronological and historical development of selected element with photographs, pictorial evidences that records actual events or personality, Intangible cultural heritages, religious beliefs and customs, bibliographic details in a logical arrangement, performance indicators of institutions, live events through scripts, and socio-economic conditions that depict social conditions without fictionalization.

## **Research Limitations**

This study serves as a preliminary study on souvenirs in relation to documentation aspects in Sri Lankan Tamil souvenirs and provide evidence for the historical development of specific ethnic group in Sri Lanka.

## **Practical Implications**

Deep researches of this kind could be encouraged on different sources relevant to documentation works of Sri Lankan Tamils.

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## **URKUND VS. TURNITIN: COMPARISON OF PLAGIARISM DETECTION TOOLS**

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### **Introduction**

Plagiarism is a burning issue in education, industry and research community at present and in need of reexamination. It is known as compelling or attempting to take or use of another person's work/s, without referencing or citing him/her as the owner of the work. This may include direct copy and paste, modify the text of the original information obtained from other resources. Encyclopedia Britannica (2011) defines plagiarism as, "the act of taking the writings of another person and passing them off as one's own. The fraudulence is closely related to forgery and piracy-practices generally in violation of copyright laws". Moreover, plagiarism is considered as one of the academic integrity issue, and substantially influence the academic writing.

Depending on the depth of stealing, plagiarism can be classified into five categories, such as, copy and paste plagiarism, word switching plagiarism,

ghost writer, self-plagiarism and paraphrasing (Mini, 2015). In order to detect plagiarism, manual and automatic detection methods are employed. Manual detection of plagiarizing requires a substantial effort and excellent memory, and it is not effective for a large number of documents. Whereas, automatic detection allows huge collections of documents to be compared to each other, by using different kind of software and tools, such as PlagAware, PlagScan, iThenticate, Academic Plagiarism, The Plagiarism Checker, Urkund, Turnitin, etc. (Birkić, Celjak, Cundeković, & Rako, 2016).

Though several commercial and online software are available, still plagiarism detection and prevention is a challenge for the academic community, worldwide (Mini, 2015). In Sri Lanka, academics attached to higher educational institutions, largely use Urkund and Turnitin for the purpose of plagiarism detection. Even though this plagiarism detection software became popular among the university academics for plagiarism checking, awareness of characteristics and familiarity with functionalities of these software are poor among them. Hence, this study is undertaken to compare and contrast the features and performance of these two software used in plagiarism detection, with the intention of creating awareness among university academics with regard to plagiarism detection tools. In addition, this study would help in the selection of suitable plagiarism detection software for the higher educational institutions in Sri Lanka.

### **Aim and Objectives**

This study aimed to compare and contrast the features of Urkund and Turnitin plagiarism detection software qualitatively, and measure the performance with special reference to Proceedings of the Jaffna University International Conference 2016. Specific objectives of the study are:

- To compare the features and properties of Urkund and Turnitin software
- To compare the performance of Urkund and Turnitin software, in terms of similarity percentage

### **Methodology**

In order to compare and contrast the features of Urkund and Turnitin plagiarism detection software, publications related to both software were extensively reviewed and tabulated (Ahmed, 2015; Birkić et al., 2016; El Tahir Ali, Dahwa Abdulla, & Snášel, 2011; Hong & Cheng, 2016; Naik, Maheshkumar, & Mahender, 2015).

Consequently, Proceedings of the Jaffna University International Conference 2016 was selected to examine the performance of Urkund and Turnitin plagiarism detection software, in terms of similarity percentage. The proceeding consists of 67 articles in various disciplines, such as Agriculture, Arts and Humanities, Education, Health, Management, Pure science, Sports science, and Social science (Table 1).

Similarity percentage for all the articles (n=67) were checked in both plagiarism detection software. Subsequently, difference in similarity percentage (SP) for each article calculated, according to the formulae given below:

$$\text{Difference in Similarity Percentage (SP)} = \text{TURNITIN}_{\text{SP}} - \text{URKUND}_{\text{SP}}$$

Then, the findings were interpreted and reported with the help of tables and graphs.



**Table 1: Discipline-wise distribution of articles checked in Urkund and Turnitin**

Code	Discipline	Number of Articles	
		Tamil	English
AG	Agriculture	-	07
AHS	Arts and Humanities	03	05
ED	Education	06	01
HEA	Health	-	10
MGT	Management	01	11
PS	Pure Science	-	06
SPO	Sports Science	-	06
SS	Social Science	-	11
<b>Total</b>		<b>10</b>	<b>57</b>

## **Results and Discussion**

The criteria such as, extendibility, usability, whether local or web-based, supportive file format/s, user category and presentation of results were selected to compare Urkund and Turnitin plagiarism detection tools, on careful reviewing of several publications related to these plagiarism detection tools (Abad-García, 2019; Ahmed, 2015; Birkić et al., 2016; Buckley & Cowap, 2013; El Tahir Ali et al., 2011; Heather, 2010; Hong & Cheng, 2016; Mini, 2015; Naik Student et al., 2015; T.A.E., N., & S., 2015). Comparison of technical features and properties of Urkund and Turnitin is illustrated in table 2.

**Table 2: Comparison of technical features and properties of Urkund and Turnitin**

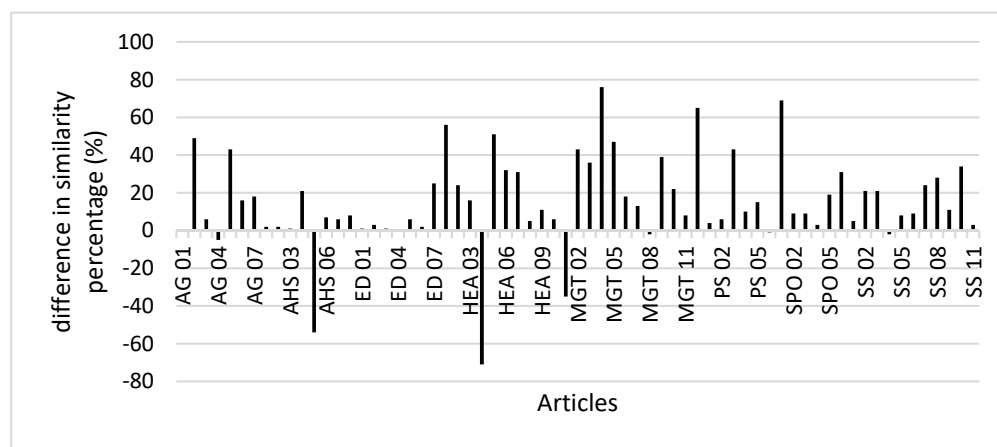
Criteria	Urkund	Turnitin
<b>Extendibility</b>		
Availability of Available Programming Interface (API) and plug-in facility Distribution	API is available and over 40 Learning Management Systems (LMS) can be integrated More than 2,000 customers (comprises academic institutions, secondary schools and organizations) situated in more than 70 countries	API is not available and LMS integration is possible According to the manufacture report, more than 10,000 institutions (mainly academic and corporate organizations) located in 135 countries
<b>Usability</b>		
Source coverage	<ul style="list-style-type: none"> <li>• Internet sources</li> <li>• Published materials (books, reference works, scientific articles, etc.)</li> <li>• Student assignments</li> </ul>	<ul style="list-style-type: none"> <li>• Internet sources</li> <li>• Publications (Reference works, scientific articles, books, etc.)</li> <li>• Student assignments</li> </ul>
<b>Local/web-based</b>		
Service location	Online. No facility for local server installation	Online. No facility for local server installation
Support	Regular support	Regular support
Cost	LKR 500,000.00 (approx.) for 100 teacher accounts	USD 5,870.00 (price varies depending on the features requested)
<b>Supportive File format/s</b>		
Supported file formats	.doc, .docx, .xls, .xlsx, .sxw, .ppt, .pptx, .pdf, .txt, .rtf, .html, .htm, .wps, .odt. Copy and paste facility available	All file types are allowed Copy and paste facility available (only the relevant text can be copied and pasted, if it is more than 100 Mb)
<b>User category</b>		

Authentication and user roles	<ul style="list-style-type: none"> <li>• Administrator</li> <li>• Teacher</li> <li>• Student</li> </ul>	<ul style="list-style-type: none"> <li>• Administrator (Authorized person to create instructor accounts)</li> <li>• Additional features for different user categories available (with additional payment)</li> </ul>
Administrator	<ul style="list-style-type: none"> <li>• Create organizational levels and teacher accounts</li> <li>• Access to user statistics</li> </ul>	<ul style="list-style-type: none"> <li>• Create instructor accounts</li> </ul>
Teacher account	<ul style="list-style-type: none"> <li>• Upload and get the analysis report for a particular document</li> <li>• Receive analysis report of the student submission</li> <li>• Facility to manage student submissions</li> </ul>	<ul style="list-style-type: none"> <li>• Upload and get the analysis report for a particular document</li> <li>• Receive analysis report of the student submission</li> </ul>
Student account	<ul style="list-style-type: none"> <li>• Own account can be created with the email address</li> <li>• Facility to upload documents for plagiarism checking</li> <li>• Analysis report received by the teacher can be shared with the student through email</li> </ul>	<ul style="list-style-type: none"> <li>• Facility to manage student submissions</li> <li>• Own account can be created with the email address</li> <li>• Facility to upload documents for plagiarism checking</li> <li>• Analysis report received by the teacher can be shared with the student through email</li> </ul>
<b>Presentation of results</b> Settings	<ul style="list-style-type: none"> <li>• Urkund repository and few web pages can be excluded</li> <li>• Analysis report received via email</li> <li>• Document submission in PDF format via email, as attachment</li> </ul>	<ul style="list-style-type: none"> <li>• Turnitin repository, references, quotes and few other sources can be excluded</li> <li>• Analysis report appeared in the Turnitin system itself</li> <li>• Documents submitted can be downloaded as PDF format</li> </ul>

Content of the Analysis report	<ul style="list-style-type: none"> <li>• Document information</li> <li>• List of sources</li> <li>• Function bar</li> <li>• Original document</li> <li>• Copied source</li> </ul>	<ul style="list-style-type: none"> <li>• Document information</li> <li>• Submission details</li> <li>• Report</li> <li>• List of Sources</li> </ul>
Source categorization Tools	Primary, alternative and sources not found Function bar available with several options to detect the plagiarism	Internet sources, publications and student papers Colour codes and numbering system facilitate the user to identify the source easily

Comparison of Urkund and Turnitin revealed that both have similar features with regard to service location, support, settings, multiple user categories and analysis facilities. However, Urkund demonstrates similarity in text, shows sources that are similar to the submitted document (on one side of the screen) and allows parallel view for the teacher to detect the plagiarism. Further, Urkund analysis report has several options to detect the manipulations made within the text.

Turnitin content database provides an unparalleled repository of more than 70 billion current archived web pages. This ever growing database ensures the most comprehensive collection of content for similarity checking and plagiarism detection for students, researchers and publishers (Birkic et al., 2016). In addition, Turnitin differentiate the plagiarized sources using different colour codes and numbering system.



**Figure 1: Difference in similarity percentage of the articles checked with Turnitin and Urkund.** [AG-Agriculture; AHS-Arts and Humanities; ED-Education; HEA-Health; MGT-Management; PS-Pure science; SPO-Sports science; SS-Social science]

Figure 1 shows the similarity percentage difference between Turnitin and Urkund with regard to 67 articles published in the Proceedings of the Jaffna University International Conference 2016. Except four articles belonging to agriculture, arts and humanities, health and management disciplines, all remaining articles exhibited positive difference in relation to similarity percentage. Furthermore, similarity percentage difference is greater among the articles belonging to agriculture, health, management and pure science compared to other disciplines. These results revealed that source coverage in Turnitin is relatively more than Urkund for the above mentioned disciplines. Besides, it is worth mentioning that these are the major disciplines having high number of sources with restricted access.

## **Conclusion**

This paper compared the features and properties of Urkund and Turnitin plagiarism detection software, and analyzed their performance with respect to similarity percentage of articles belonging to agriculture, arts and humanities, education, health, management, pure science, sports science and social science disciplines. Comparison of technical features and properties revealed that both plagiarism detection tools have similar features and facilities, except source coverage and format of the analysis report. Several studies indicated that Turnitin has more coverage for restricted access publications than Urkund (Ahmed, 2015; Buckley & Cowap, 2013; Heather, 2010; Mini, 2015; Naik *et al.*, 2015). Instead, Urkund analysis report is more informative than Turnitin and it also detects text manipulations.

Moreover, performance analysis showed that, 94% (n=63) of the articles have greater similarity percentage in Turnitin compared to Urkund. Further, significant difference in similarity percentage is observed in the agriculture, health, management, and pure science disciplines. This finding

provides an indication that source coverage in Urkund is limited for specific disciplines. In addition, inconsistency observed in the similarity percentage for a particular piece of work submitted in Urkund, at different instances. Since source coverage is one of the main features considered in academic ethics for a plagiarism tool, this study highlighted that, comparatively Turnitin has more source coverage and provides dependable analysis reports. As such, this study recommends Turnitin for detection and prevention of plagiarism in the higher educational institutions of Sri Lanka.

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## **AWARENESS AND UTILIZATION OF E-LIBRARY RESOURCES BY UNDERGRADUATES IN THE UNIVERSITY OF KELANIYA**

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**Key words:** E-library awareness, E-library utilization, University libraries,  
University of Kelaniya, Undergraduates

### **Introduction**

By 2019, the e-library in the University of Kelaniya consists of three data bases namely Emerald, Taylor and Francis and Oxford University Press subscribed through “The Consortium of Academic Libraries of Sri Lanka (CONSAL)”. Apart from the CONSAL databases, the users could access EBSCOHost database through e-library facility which was subscribed to the University of Kelaniya as an individual subscription. In addition to above resources, the library has given the opportunity to access past question papers and number of other electronic resources including e-books, e-journal articles etc. As an accumulation of above types of resources, the library of the University of Kelaniya has facilitated an E-library with a collection of 168021 electronic books and 22,313 electronic journal titles by the year of 2019. Hence, this study was carried out to examine the undergraduates’ awareness and utilization of the above electronic resources available in the library, University of Kelaniya.

The University of Kelaniya has seven faculties. But, this study comprised only four faculties named by Humanities, Social Sciences, Sciences and Commerce and Management Studies. Above mentioned four faculties are located in the Dalugama University premises itself. Based on the geographical conveniences for collecting data, this study was confined to above four faculties.

Mainly, this study was intended to find out the significant correlation between awareness of e-library resources and the contribution given by both university lecturers and library staff to make undergraduates aware of the e-library resources and to enhance the ability of using e-library resources by the undergraduates in the University. Several hypotheses were formulated to find out the correlation between usage and awareness of electronic resources.

- There is a significant correlation between awareness of e-library resources and the contribution given by both university lecturers and library staff
- There is a correlation between usage of e-library resources and the contribution given by both lecturers and library staff to enhance the usage of electronic resources.

The overall results were evaluated comparing faculty-wise awareness and usage of e-library resources. Finally, main obstacles faced by the undergraduates while using the e-library resources were identified and further suggestions and recommendations made for enhancing awareness and usage of E-Library resources among the undergraduates in the University of Kelaniya.

A significant number of studies have been carried out to find the usage of electronic resources available in the academic libraries. A study by Ahmed (2013) explored the undergraduates' usage and level of satisfaction with

regard to subscribed electronic databases by two university libraries in Bangladesh. Survey results indicated that undergraduates were not fully satisfied with the university subscribed databases. Respondents stressed that limited access to computers and slow download speed were the main drawbacks of using electronic databases. Manorama and Kumar (2014) have examined the usage of online resources at the Jawaharlal Nehru University in India, under the UGC-INFONET consortium based on monthly user statistics. The study results emphasized the seasonality effect with related to utilization of electronic resources in the library. The number of article downloads is significantly high before the exams of the university. Furthermore, the study findings revealed that there is an overlapping in terms of coverage of information sources in electronic databases.

### **Methodology**

The total population consisted of 6935 undergraduate students representing the faculties of Humanities, Social Sciences, Sciences and Commerce and Management Studies. The sample was calculated using Krejcie and Morgan determination table and according to the table the calculated sample size was 364 undergraduate students within the four faculties. The data were collected using questionnaires. 364 questionnaires were distributed using stratified random sampling technique (Krejcie & Morgan, 1970).

### **Data Analysis**

The response rate for the questionnaires were 100% and all the collected data were analyzed using Statistical Package for Social Sciences (SPSS). The formulated hypotheses were tested using Chi-square test and results were illustrated wherever needed.

## Results

Chi-Square Test was applied to find out the correlation between user awareness and contribution by library staff and university lecturers for making undergraduates aware with the e-library resources. The result of the test has shown that there is a significant correlation between awareness and the contribution by lecturers as well as library staff in the University of Kelaniya (Table 1).

**Table 1: Correlation between awareness and the contribution by lecturers and library staff**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.628a	8	0.067
Likelihood Ratio	15.409	8	0.052
Linear-by-Linear Association	7.062	1	0.008
N of Valid Cases	351		

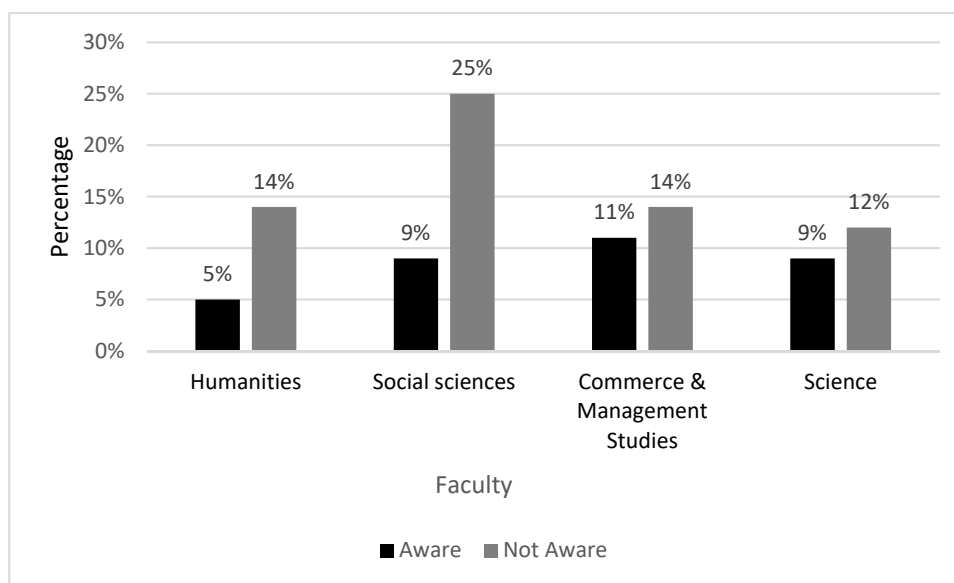
Chi-square test has shown another significant correlation between usage and the contribution by lecturers and library staff to enhance the usage e-library resources (Table 2).

**Table 2: Correlation between usage and contribution by lecturers and library staff**

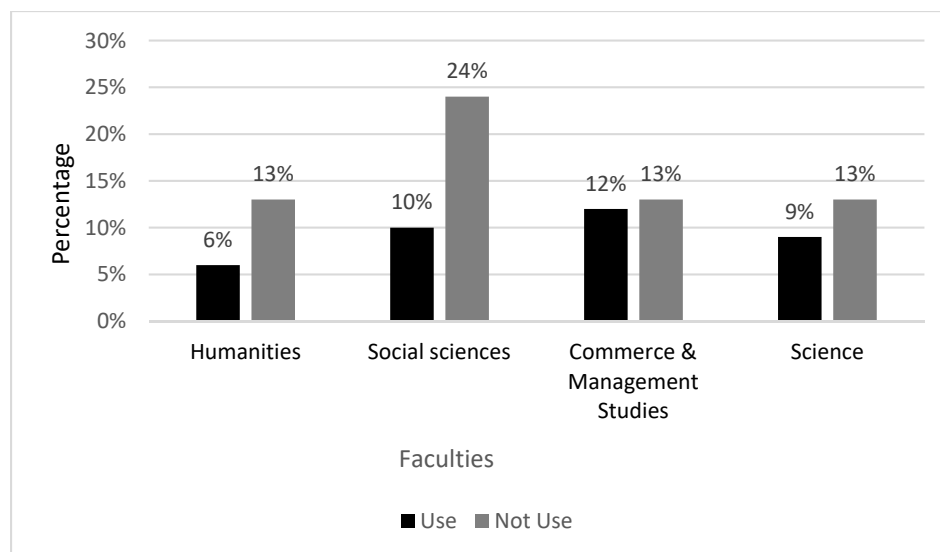
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.628a	8	0.067
Likelihood Ratio	15.409	8	0.052
Linear-by-Linear Association	7.062	1	0.005
N of Valid Cases	351		

Figure 1 illustrates the faculty-wise awareness of e-library resources among the undergraduates in the University of Kelaniya. The results show that majority of the users (with 11%) from the faculty of Commerce and

Management are aware of the e-library resources while undergraduates in the Faculty of Humanities shows the least percentage (with 5%) of awareness.



**Figure 1: Faculty-wise awareness of e-library resources**



**Figure 2: Faculty-wise usage of e-library resources**

Most of the respondents (12%) in the faculty of Commerce and Management Studies use the e-library while Faculty of Humanities shows the least usage (6%). Furthermore, most of the respondents (24%) in the Faculty of Social Sciences do not use the e-library resources (Figure 2).

According to the results, several problems were encountered by the undergraduates while using the e-library resources such as, unavailability of remote access facility, lack of knowledge in searching strategies, less awareness of organized user education programs conducted by the library etc. The respondents have made some recommendations to be considered regarding how to enhance their awareness and usage of e-library resources. Organized user education programs should be communicated in an effective manner, offering the remote access facility to access the resources are major points they have suggested.

## **Discussion**

Based on the responses, there are several important facts that should be considered further. User education programs should be more organized for enhancing the awareness and usage of available electronic resources among the undergraduate students in the University of Kelaniya. Moreover, remote access facility should be expanded for undergraduate students enabling them to access needed resources every time. Internet facility and Wi-Fi facilities should be enhanced further. Also, user education programs should be conducted to make them aware with the high skills of searching strategies to find relevant electronic resources.

## **Conclusion**

In conclusion, the faculty-wise comparison shows a significant decrease of the awareness and usage of e-library resources. Contribution of both lecturers and library staff has greatly affected in enhancing the awareness and usage of e-library resources in the Library, University of Kelaniya. Therefore, as suggested by the respondents, remedial steps should be taken to enhance the awareness and usage of e-library resources among the undergraduates in the University of Kelaniya.

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**VETERINARY MEDICINES MENTIONED IN THE PALM LEAF  
MANUSCRIPT COLLECTIONS AT THE LIBRARY OF NATIONAL  
MUSEUM OF COLOMBO**

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**Keywords:** Indigenous medicine, National museum, Palm leaf manuscripts,  
Veterinary medicines

**Introduction**

Traditional Indigenous Medicine is unique and is a landmark heritage in Sri Lankan territory. The traditional Indigenous Medicine system is a collection of several streams. Tumours (Gedi Wedakama), traditional orthopedic treatment system (Kedum Bindum Vedakama), Sarvanga (physicians) and Eye medicine (Aksi wedakama), etc., are some of the treatments in traditional indigenous system. In addition, they have treated animal diseases too. As mentioned in the chronicles of Sri Lanka, indigenous medical treatments were done even to the animals. King Buddhadasa had a very good knowledge of the medicine and according to the legends, he successfully mastered treatments for both people and animal. The chronicles mentioned that doctors have been appointed to treat animals (Mahavamsa, 37, 124-145). The indigenous medical treatments have evolved from thousand years and transmitted from generation to generation (Attanayaka, 2005, p. 39).



The major collection of palm-leaf manuscripts in Sri Lanka could be obtained from the library, National Museum of Colombo (Bulathsinghala, 2012, p.85). There are over 4,000 manuscripts and the "Cullavagga" text of the Vinaya Pitaka of the 13th century deposited in this library was the oldest manuscript discovered so far (Amarakoon,1996). The manuscripts were consisted in various subjects as well as variety of languages. These are written in Sinhala, Pali, Sanskrit, Burmese, Telegu and Tamil characters and the subject coverages are Buddhist Canon, Sinhalese Literature, Prose and Verse, History and Tradition, Grammar and lexicography, Art, Indigenous Medicine and Veterinary Science, Astrology, Demonology, Science, Architecture, and Folklore (Alahakoon, 2006, p. 54-55). The palm leaf manuscripts on traditional indigenous medicine are one of the most important manuscripts found in Sri Lanka. Most of the researchers focus their research on indigenous medicine for human diseases and treatment. Many of them have not focused their research on indigenous veterinary medicine for animal diseases and treatments.

### **Objective**

The main objective of the study is to identify the indigenous medicine methods for animals mentioned in the palm leaf manuscripts. It is expected to analyze the following categories.

- Recognize the diseases of the animal
- Identify the methods of treatments and medicines for diseases of the animals

## **Methodology**

The visual observation and it adapts the content analytical technique using the primary data included in the veterinary science palm leaf manuscripts collection in the library, National Museum of Colombo.

## **Data Collection**

The largest collection of palm-leaf manuscripts is available in the library, National Museum of Colombo. The study was based on veterinary science palm leaf manuscripts containing medical treatments for animals. It was selected 10 palm leaf manuscripts including five (05) Ali wedapotha (elephants) and five (05) Gava wedapotha (cattle) on veterinary science. These were written in Sinhala and Sanskrit languages and they were considered for the content analysis.

## **Results**

In this study, after analyzing the palm leaf manuscripts collection at the library, National Museum of Colombo, it was observed that indigenous medicine was used for diseases of elephants or tuskers and cattle. It was noticed some diagnosis methods and treatments for disorder and injury of elephants and tuskers such as eye diseases, abdominal ailment, hyperacidity, wound and rash occur on the skin, dog biting, snakes biting and worm diseases etc. are available in this veterinary science palm leaf manuscripts.

In addition to medical treatment for elephants and tuskers, indigenous treatments for cattle were also observed. It includes treatments for the ear diseases of the cattle, hooves, horns, mucus and fever diseases, diseases occurring from cold and heat, especially diseases for the pregnant cows and diseases caused by snakes biting such as cobra and viper.

These veterinary science palm leaf manuscripts have explained various treatment methods for variety of diseases with different kind of medicine. These animals were treated with local medicines. It is clear that the animals were healed by using medication prescription and treatment such as herbal oils, paththu (herbs and plants to make a pastes), choorna (Choorna is a dry powder made by crushing and powdering the herbs), guli (tabloids), kalka (Kalka is made by crushing the herbs and plants to make a pastes), nasna (medicine inhaled through the nose), kasaya (juice of herbs) etc.

### **Recommendations**

According to the content analysis, various prescriptions, treatment methods and medicines for diseases of elephants, tuskers and cattle were identified. Therefore, it is possible to state that palm leaf manuscript collection which belongs to library, National Museum of Colombo demonstrate valuable facts and details for veterinary medicine. This palm leaf manuscript collection is very important for studying indigenous medicine.

Though, this collection has been applied microfilming as a means of preservation of the palm leaf collections, some palm leaf manuscripts have no facilities to obtain the copies by using microfilmed reels. Therefore, it is advisable to go for best digital preservation techniques to safeguard this valuable collection. Digitization is a useful technique that could be applied for conservation as well as to enhance the usage of this palm leaf manuscript collection.

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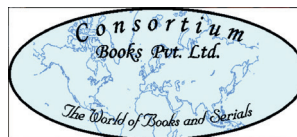
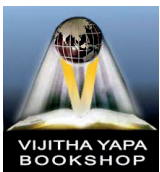
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