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CONTENTS

Public Library as an Educational Information Centre

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Abstract

Public library helps different sectors of the society by providing right information to the right reader at the right time. IFLA has devised four important objectives of Public Library such as education, information, culture, and leisure. The main objective of the articles is to describe educational functions of Public Library in the society. Public Library is a place, which can be approved for serious reading for formal learners, as teachers and students. Public Library should cater distance education students by way of building up its collection according to the need of the students, acting as study centers/ etc. Public Library also provides the means of continuing education, aid adult education. Adult education programme can be implemented through Public library effectively. The article concludes that Public Library is a Library's library. Public Library has moral responsibility to fulfill the needs of the intellectual requirements of the public.

Keywords*: Children's Section, Collections, Distance Education, Education, Institutions.*

1. INTRODUCTION

Public Library has been regarded as an integral part of the social framework from the very beginning. It is considered as a social agency charged with the responsibility of serving the information needs of the society without any discrimination. A Public Library helps different sectors of the society by providing right information to the right reader at the right time. For example it will help children to create reading habit, unemployed youths to get better jobs and farmers to improve agricultural production. informal education programmes such as adult education, distance education and literacy campaign, need the help of some viable agency. Public Library caters to the educational needs of all segments of the population. Public Library must be readily accessible and its doors remain open for free and equal use by all members of the society regardless of race, colour, nationality, sex, religion, language, status or educational attainments.

The UNESCO in its Public Library manifesto revised by the Public Library section (IFLA), has devised four important objectives and functions of the Public Library which are as follows:-

1.Education: to foster and provide means of self-development of individual / group at whatever stage of education, closing the gap between the individual and recorded knowledge.

2.Information: to bring to the individual/group accurate information quickly and indepth, particularly on topics of current concern.

3.Culture: to be one of the principle centres of cultural life, promote a keener participation, enjoyment and appreciation of all the arts; and

4.Leisure: to play in encouraging the positive are a of leisure and provide materials for change and relaxation.

2. PUBLIC LIBRARY AND EDUCATIONAL DEVELOPMENT

Public Libraries have the responsibility to educate its clientele. Education is a long process from childhood to old age.

Library plays a vital role by helping the citizens pursue both formal and informal education. Public Library is probably the only public agency to provide education to one and all within the society without the distinction of caste, colour, creed, sex and nationality. That is why it is called a "Peoples University." It serves as a centre for growing and stimulating intellectual curiosity and the desire to learn among people by offering, materials and programmes to satisfy their desire to seek knowledge. The present day education is no more a one-way system in which the student has a passive participation.

Library is one of the main plans on which cultural, social and economical development of the country

depends. In a country like India Public Library has a responsibility to increase the number of literate and educated people through appropriate programmes. Public Library can also provide a solid base to the national literacy mission. There are enough cases of people slipping back to literacy for want of reading material. Therefore, only libraries can act as tools for sustaining literacy in the country.

3. FORMAL EDUCATION

The term "formal education" is used to describe the hierarchically structured, chronologically graded system, from primary school through university and including in addition to general academic studies, a variety of specialized programmes and institutions for full-time teaching and professional training.

The general impression prevailing in our country about a Public Library is that it is an institution providing books, chiefly novels, for recreational reading. This impression is based on the actual service rendered by the large majority of the Public Libraries of the country. Few people regarded it as a place, which can be approached for serious reading for educational purpose. But the Public Library has an important educational function to perform.

Public Library must serve the teachers and students of the educational institutions in its area by acquiring books of academic importance, suited to their needs. No educational institution is able to make available in its own library all the books required by its users. The Public Library should,there fore, supplement the resources and services of these academic libraries.

4. ROLE OF PUBLIC LIBRARY TOWARDS CHILD READING

The importance of Public Library also should not be over looked. Librarians in the Public Library, work with parents and their infant or preschool children, through story time and other parenting programs, to develop critical emergent literacy skills which will help children to come to kindergarten ready to learn and read. Public Libraries rely almost entirely on motivation to attract children; thus, they have well-developed programs for motivating readers.

Public Librarians create opportunities for students to read through the following methods:

1. Public Libraries run summer-or after school reading programs, story telling, author and book discussion programs.
2. Employing professional librarians specifically to lead children to the books that will interest them.
3. Offering field trips to preschool and elementary school children to familiarize them with what the Public Library offers them.
4. Ensuring that library hours extend beyond school hours, on weekends and vacation weeks, giving children access to books when they do not have access in the school classrooms or school library.
5. Creating special areas in the library that appeal to the children.
6. Developing and actively advocating for a budget that provides children of all ages with adequate numbers of up-to-date books.

5. DISTANCE EDUCATION

Distance Education (DE) can be broadly defined as education provided to the people without attending regular classes in the formal way. It relates to all those academic programmes offered by an educational institution to the people enabling them to acquire skills/proficiency without attending regular classes. Many other terms which denoted the same or a related concept are correspondents Education Home study, Independent study, External study, Distance learning and open learning. All these terms are associated with non-traditional teaching and learning programmes; where the learners and teachers are linked with study materials like printed media and electronic media.

5.1 Public Library for Distance Education Students

The method of instruction for Distance Education students comprises mainly of printed media (i.e. study materials) supplemented by electronic media i.e. audiovisual materials with the support of a few Personal Contact Programme(PCP) classes. In a country like India, where 80% of the population is living in rural areas, the printed media is the easiest means of communication.

Some times the DE students may not be fully satisfied with the study materials supplied to them. They might like to refer sources and latest books and other documents. Further, the study centers of the universities may not be much useful because, the may be located in a few places far away from the student's places. The working hours of the study centre also may not be

suitable. Added to this, it is very difficult to the college libraries to cater to the needs of DE learners in the existing setup of Academic Libraries. Moreover, in the study centre the DE students cannot borrow books for home reading. Most of the adult students are busy people, often with occupational and domestic responsibilities. They naturally expect to have library service near at hand, if they are to take advantage of it. Public Libraries are of enormous help to such students.

The national policy on library and Information system, which is under the consideration of the Government, has laid emphasis on the development of an effective Public Library system in every state to cater to the requirements of DE students. Since a Public Library is an Institution of the public for the information requirements of all. The distance education students are not an exception.

6. SUGGESTED PROGRAMMES FOR PUBLIC LIBRARIES

Public Libraries are busy in providing regular services to the public at large, yet they have to play their role in the promotion of DE. Without well equipped Public Libraries, the purpose cannot be achieved. There is need for an integrated, balanced, foresighted, sensible and comprehensive Public Library planning to achieve the desired objectives towards DE.

6.1 Building up of Library Collections

The selection and acquisition of self-instructional materials and learning packages developed by DE providers/ Universities should be given top priority in building up of library collections in addition to other categories of documents. A provision has to be made to procure audio-visual and other non-book materials to facilitate DE students. In this connection, it may be pointed out that, since it is not possible to strengthen all the Public Libraries in this way, a selective approach may be made. For this purpose a few district central libraries may be selected to serve the DE students.

6.2 Public Libraries as DE Study Centre

The establishment of study centre in the rural and semi urban areas by the DE Universities may not be possible and feasible due to financial and other administrative reasons have to plan and initiate necessary steps in setting up of study centre collectively of few District control libraries as DE study centre.

6.3 Adequate Provision of Financial Resources

The Financial resources may not be adequate for the public libraries to cater to the needs of DE learners. For this purpose university offering DE programmes contribute enough funds for those libraries as study centres. Further District libraries can raise additional funds by motivating philanthropists and the same may be diverted towards the improvement of DE programmes.

6.4 Co-ordination with Other Institutions

No library, is self-sufficient in collection of books. Therefore, it is suggested that the designated PUBLIC LIBRARIES as study centres have to establish and develop proper co-operation with academic libraries and documentation centres that will facilitate the development of DE Programmes.

7. ADULT EDUCATION

The term “Adult Education” is used to designate educational activities that are designed especially for adults. These activities are planned and may be either formal of informal. which implements them by means of a process an adult, either through his own efforts or with the assistance of another individual or group, purposely develops abilities, acquires designable attitude and gains new knowledge. Types of adult education can be classified as follows.

i. Education for vocational, technical and professional competence (such education may aim at preparing an adult for the first job or new job or it may aim at keeping him up-to-date on new developments in his occupation or profession).
ii. Education for health, welfare and family living (such education includes all kinds of education such as health, family relation, consumer buying, planned parenthoods, hygiene child care and the like).
iii. Education for civic, political and community competence (such education includes all kinds of education relating to Government, community development, public and international affairs etc).
iv. Education for “self fulfillment” (such education embraces all kinds of liberal education programmes like education in music, arts, dance, theatre, literature etc).
v. Remedial education fundamental and literacy education (such education is obviously a prerequisite for all kinds of adult education).

7.1 Public Library for Adult Education

Among the agencies of adult education, libraries are perhaps the most flexible in providing education services to adults,. A fundamental purpose of the PL is to provide the means of continuing education and to encourage the most effective utilization of theses means through a programme of activities whose effects are continuous and cumulative.

A good library should begin its adult education service with a clearly defined concept on the part of the librarian as to what the community needs is the way of library service. With the best material collection the library can afford to fulfill these needs. It should then go on to assist other adult agencies in the society through its resources, to help the society then with programme planning and materials, to provide information on adult education resources, available to community and help the individual adult with his reading programmes.

In the 50's the role of Public Libraries in adult education was keenly felt by the government of India as a result of the international conference on adult education held at Ellsinore in Denmark in 1949. The conference recognized the essential contribution of Public Library and museum to adult education in following words; "it is no use teaching people to read unless at the same time an effort is made to ensure that they have books worth reading."

7.2 Public Library Services for Adults

Libraries can provide a wide variety of services for adults depending upon the goal to be achieved and the extent of staff, skill, time, and library resources available. Any library service programme designed for adults would be successful only if it is based on the needs and interests of the community to be served.

While planning adult library services, three basic sources of information to be used are:

Studies undertaken to identify, the needs interests and concerns of the adults of the community.

Studies undertaken to find out, the basic characteristics and social role of adults.

Those areas of knowledge in which adult wish to gain more information of current social problems, political and economic problems and the areas of human life.

No single source is adequate for providing the basis for planning adult library services. First of all, library staff should identify and decide the information needs that can be met by the library and the needs that are to be met more effectively by other agencies and organizations. Out of these two, the latter point may be decided on the basis of the strengths and weakness of the library resources and the training abilities and skills of the library personal to meet the need of the adults.

8. CONCLUSION

This paper clearly exposes how a Public Library can dedicate itself for the betterment of education. All the social institutions are expected to cope up with the revolution. Public Library as a social institution has greater responsibilities in disseminating the knowledge to every book and corner of the country by providing necessary reading materials. All the educational institutions play their role perfectly in opening the doors of educations to all, irrespective of the distance and all the Public Libraries are trying sincerely to feed necessary information to the students. In the non-formal education, the distance is the problem. The institution that can come to its rescue is only the Public Library. So the need of the hour is mutual help and clear understanding between these two systems. If they come closer, everything will come closer. People expect so much from the Public Library because, Public Library is "Library's library". It is the moral responsibility of the Public Library to fulfill this obligation in order to convert the illiterate into literate and scholar into scholar extraordinary. This is a great expectation of public library.

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Periyar University Literature Output during 2000-2015: A Scientometric Study

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Abstract

An attempt has been made to evaluate the scientific literature output published by the faculty members of Periyar University to support and improve the information academically. A total number of 856 scholarly papers have been collected from the Web of Science (WOS) database between 2000 and 2015. This article motivates on different characters in terms of publishing trend, authorship pattern, type of documents, research area – wise, collaborative countries wise distribution and measuring techniques such as RGR, DT, DC, have been used for better research outcome during the study period.

Keywords: Authorship Pattern, Periyar University, Research trend, Scientific Publications, Scientometrics, WoS.

1. INTRODUCTION

In the year September 1997, Periyar University was brought out by the Government of Tamilnadu with aims at developing knowledge in various fields to realize the maxim inscribed in the logo wisdom maketh world which means 'Arival Vilayum Ulagu'. The university is named after the Great Social Reformer E.V. Ramasamy affectionately called 'Thanthai Periyar'. Periyar University accredited with 'A' Grade by National Assessment and Accreditation Council (NAAC) recently is located at Salem, Tamilnadu. The University central library of this university houses more than 75,000 books and 3000 back volumes of journals and 2800 dissertations. The UGC-INFONET digital library provides various e-resources and makes the learning process 24/7. Periyar University has an exclusive computer centre, which takes care of web development. The network connectivity in the campus has lent a competitive edge to students, teachers and researchers in their academic and research pursuits.

Scientometric study is a branch of science of science which is used to analyse the quantitative and qualitative techniques on science domain in general. The scientometric technique is based on the bibliometrics. A number of scientometric studies have done in different disciplines, organizations and institutions (national as well as global) and even a number of single journal studies have also done by various eminent scientists and research scholars. This present study focuses on scholarly publications published by the faculty members of Periyar University.

2. RELATED WORK

A number of studies have done on bibliometrics as well scientometrics in different subjects such as social science, life science, environmental science, R& D literature outputs, and doctoral studies by eminent research scientists. Here, a few of them have been taken to strengthen the study. Zouhayr and Fereshteh (2010) have carried out the study on Iranian researchers' collaboration with their colleagues of other countries using science citation index to examine the scientific publications produced by them. The total records were 33,813 and the papers were employed the survey research techniques to answer the questions. Based on the study, the results revealed that the Iranian scientists have had collaboration with 115 countries and their research productivity have increased in the SCI database from 1998 to 2007. The results have also shown that the international collaboration in different subject areas revealed that geosciences had the higher number of publications and co-authored internationally.

Hung et al (2015) have examined how universities perform in knowledge utilization with a sample of world's top 300 research universities which are located in North America, Europe and East Asia during the period from 1995 to 2005 and the number of articles were collected using the SCI and SSCI databases and administered the statistical data from USPTO patent database. The results showed that out of 300 research universities, in 1995, 136 universities are located in Europe, 34 in East Asia and 130 in North America. In the year 2005, the above universities have been increased simultaneously. In this study, latent growth modeling is used for assessing the utilization of knowledge created by universities. The

results revealed that not all top 300 research universities in the world perform well in knowledge utilization of patented inventions. Morillo and Efrain-Garcia (2015) have investigated the Bibliometric analysis on technology centres of Spanish institutional sectors during the period between 2008 and 2012. The study covered TC's main functions and authors' performance, the degree of national and international collaboration and their major features; evaluation of scholarly articles, etc. for analysis, the data were collected from the web of science citation core database. The results showed that the total number of 5068 documents and 4586 research articles were published and produced by TCs. It was noticed that the TC's scientific impact was slightly higher than the average.

Maharana (2013) analysed the research articles of biotechnology faculties in Indian central universities during the period between 1997and 2006 and reported that collaboration co-efficient was 0.65. Raghuraman and Chander analyzed and compared research performance of Indian institutions with foreign institutions on selected bibliometric parameters. A more recent study compared the overall S&T publication output of India, China, and South Korea across 20 broad subjects as defined by Scopus bibliographical database. OUAT, S. K. Mishra, Agricultural and Biological Sciences, and India are the most prolific institution/organization, author, subject area, and country respectively. Bradford's Law was used to determine the scattering of literature in the publication pattern of the university which showed that the Indian Journal of Animal Research is the most preferred research journal among the university research community.

Elango and Rajendran (2012) investigated and used the Scientometric indicators like collaboration index, collaboration, co-efficient and dominance factor and analyzed Authorship trends and collaboration pattern in the Indian Journal of Marine Sciences during 2001 - 2010. The analysis showed that the co-authored papers were dominated and the collaboration rate was 0.57 and mean number of authors per jointly authored paper was 3.4. Velmurugan and Radhakrishnan (2014) have studied the scientometric analysis of the IETE Technical Review Journal during the period 2007 - 2012. The study revealed that the Degree of Collaboration was high i.e. 211 (0.827) in terms of collaborators' contribution. Further, it showed the relative growth rates (RGR) which has increased from 2007 (0.76) to 2012 (1.96) within a span of six years and the doubling time (DT) has slightly decreased. Ginn (2003) has made a survey of citation analysis of authored articles in library and information science research, 2001–2002, and found that citations of articles published in scholarly journals would be greater in number than citations of any sources. From 2001 to 2003, journal article citations increased both in quantity and percent. Journals were cited most, followed by books, chapters in books, annuals, and web sites. More than 50 percent of the cited work would be ten years old or less.

3. OBJECTIVES OF THE STUDY

The major objectives are framed for the studies with the exclusive notion are as follows:

i. To identify the growth rate of research trends during 2000 to 2015.
ii. To trace the forms of publications.
iii. To study the subject-wise publication output.
iv. To classify the Ranking of Journals
v. To determine the Year wise authorship pattern.
vi. To categorize the Authorship pattern.
vii. To examine the Relative Growth Rate and Doubling Time.
viii. To verify the degree of collaboration over the study period and
ix. To know the most prolific authors and
x. To notice the funding agencies and research areas.

4. METHODOLOGY

The required data were collected from the Web of Science Core Collection database by using the keywords "Periyar Univ*'' and the topic string is ADDRESS filed and the Time span from 1989 to 2015 which are indexed in Science Citation Index (SCI-Expanded), Social Science Citation Index (SSCI,), and Arts and Humanities Citation Index (A&HCI), and the retrieved data are 861 and again refined only recent 16 years from 2000 to 2015 and gathered 856 literature output for the present analysis dated March 18th, 2015. After collecting the data, exported to MS Excel spreadsheet to analyze statistically and tabulated and figured to get better results.

The researcher has applied percentage analysis and average score analysis as the basic tools. Apart from the above the specific bibliometric statistical tools applied are as follows:

1. Relative Growth Rate
2. Doubling Time for the Publications
3. Degree of Collaboration

4.1 Relative Growth Rate (RGR)

The relative growth rate (RGR) is the increase in the number of research publications / pages per unit of time. The relative growth rate (RGR) and Doubling time (DT) models have developed by Garg and Pathi (1999) to measure the publications. The growth rate of total research output published by faculty members from Periyar University has been calculated as per the following equation.

$$R(a) = \frac{(W2 - W1)}{(T2 - T1)}$$

R (a) = Relative Growth Rate over the specific period of interval, W1 = log w1 (Natural log of initial number of publications), W2 = log w2 (Natural log of final number of publications), T2 – T1 = Unit difference between the initial and final time, R (a) = per unit of publications per unit of time (yr).

4.2 Doubling Time (DT)

There exists a direct equivalence between the relative growth rate and the doubling time. If the number of articles or pages of a subject doubles during a given period then the difference between the logarithms of numbers at the beginning and end of this period must be logarithm of the number 2. If natural logarithm is used this difference has a value of 0.693. Thus the corresponding doubling time for each specific period of interval and for both articles and pages can be calculated by the formula.

$$\text{Doubling Time } (DT = \frac{0.693}{RGR}$$

4.3 Degree of Collaboration (DC)

The degree of collaboration is defined as the ratio of the quantity of collaborative literature outputs to the total quantity of research papers in the particular discipline during a certain period of time. It can be observed from the below table that indicates the degree of collaboration in the scientific publications published by the faculty members of Periyar university during the period of study. To determine the degree of collaboration, the formula suggested by K. Subramanyam (1983) was used.

The formula is expressed as: $C \frac{Nm}{Nm + Ns}$

Where,

C = is the Degree of Collaboration in a discipline

Nm = is the number of multi-authored research publications in the discipline published during a year

Ns = is the number of single authored research publications in the discipline during the same year

5. DETAILS OF THE RESEARCH OUTPUTS

The research output has indexed in the web of science database which were published by the faculty members of Periyar University during the period from 2000 to 2015. The details are given below.

Table 1 Detailed Research Productivity

Sl. No.	Details of the Research Output	Records
1	Results found	856
2	Sum of the Times Cited	5724
3	Sum of Times Cited without self-citations	4760
4	Citing Articles	4270
5	Citing Articles without self-citations	3907
6	Average Citations per Item	6.69
7	h-index	31
8	Total Local Citation Score	858
9	Total No of Authors	3270
10	Total cited References	30787

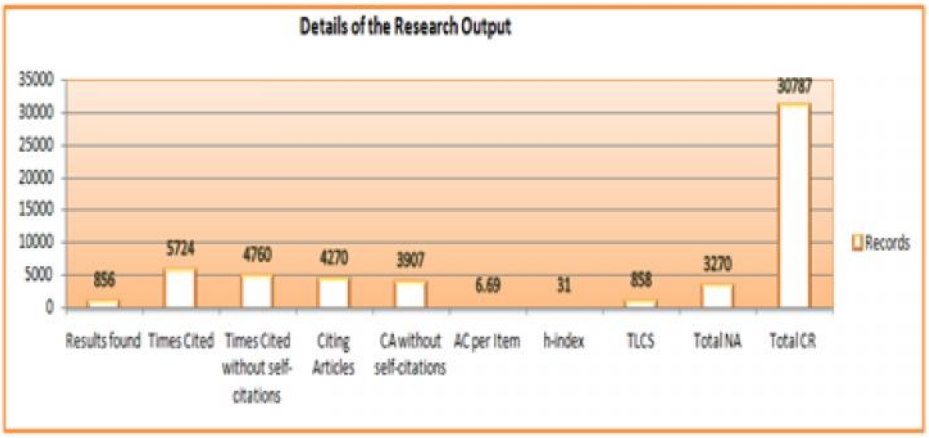

Fig.1 Detailed research productivity

6. DATA ANALYSIS

6.1 Growth of Literature and Citation Scores

Table 2 (Fig. 2) indicates that the year wise distribution of literature output, which have been indexed in the Web of Science database during the year 2000 to 2015. Of the 856, the highest number (18.1%) of articles were published in 2015 with 126 global citations, and followed by 17.4% of articles were produced in 2014 with 537 citations, and the lowest number 0.2% of research papers were published in 2000 and 2003 respectively. It was observed that the total global citations are increased in the year 2010 with 940 citations and gradually it has been decreased in the year 2015. It is noted that there is a fluctuation trend during the period of study.

Table 2 Growth of Literature

Sl. No	PY	TR	Percent	TLCS	TGCS
1	2000	2	0.2	0	4
2	2001	10	1.2	0	53
3	2002	3	0.4	0	1
4	2003	2	0.2	0	7
5	2004	1	0.1	0	6
6	2005	18	2.1	16	361
7	2006	12	1.4	20	233
8	2007	33	3.9	43	208
9	2008	47	5.5	66	618
10	2009	67	7.8	125	793
11	2010	81	9.5	114	940
12	2011	70	8.2	113	628
13	2012	97	11.3	124	673
14	2013	109	12.7	97	536
15	2014	149	17.4	121	537
16	2015	155	18.1	19	126
Total		**856**	**100**	**858**	**5724**

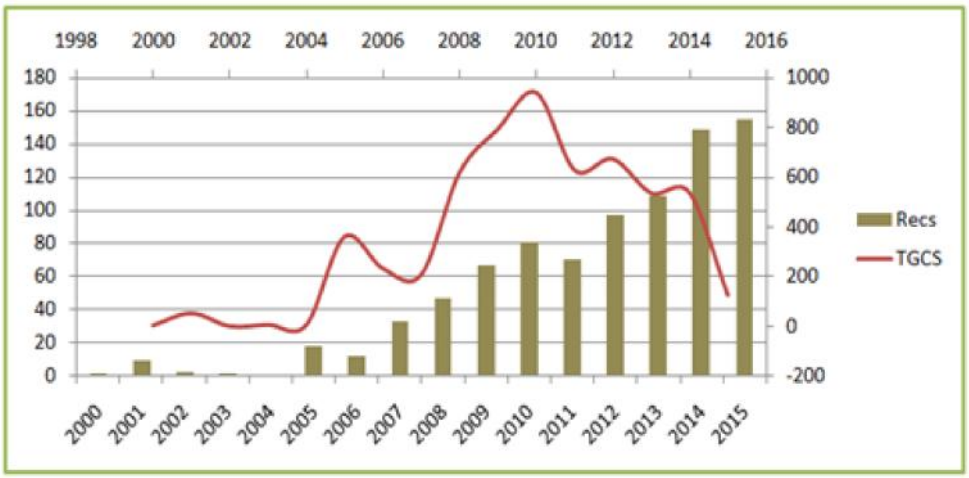

Fig.2 Growth of literature and citation scores

6.2 Form-wise Distribution

It can be seen from the Table 3 that the most of the document are peer viewed scholarly journal articles (834), which involved 97.4 per cent and the TLCS are 850 and TGCS are 5570 of the total publications. The other sources are includes review (8, 0.9 percent), meeting abstract (5, 0.6 percent), correction (3, 0.4 percent), Letters (3, 0.4 percent), editorial materials (2, 0.2 percent) and the proceedings paper (1, 0.1 percent), Even though, the original peer reviewed articles are still substantial and focuses the scientometric analysis, but counting the proceedings papers and other source types as well.

Table 3 Form-wise Distribution

Sl.No.	Document Type	Recs	%	TLCS	TGCS
1	Article	834	97.4	850	5570
2	Review	8	0.9	7	141
3	Meeting Abstract	5	0.6	0	0
4	Correction	3	0.4	1	1
5	Letter	3	0.4	0	0
6	Editorial Material	2	0.2	0	0
7	Article; Proceedings Paper	1	0.1	0	12
Total		**856**	**100**	**858**	**5724**

6.3 Relative Growth Rate (RGR) and Doubling Time (DT)

It is inferred from the above Table 4 shows that the relative growth rate and the doubling time on scientific papers produced by the faculty members of Periyar University. Based on the analysis, the relative growth range is from 0.18 to 2.89 whereas the doubling time range is from 0.40 to 3.85. It is revealed that the relative growth rate has been increased trend on the other hand, the doubling time range has been decreased during the period of study.

6.4 Authorship Pattern

It is evident from the table 5 that the authorship pattern of publishing research articles by the faculty members of Periyar University. The maximum number of papers was published by the three authors with (29.21%), which is ranked in the first and followed by two authored papers have occupied in the second with (22.78%) and in the third place has received by four authors with (19.39%) and the least number of articles have published by 12th, 13th, and 15th authors with single papers respectively.

Table 4 Relative Growth Rate and Doubling Time

Year	No of Papers	Cum. Papers	W1	W2	W2-W1	DT (0.693/ RGR)
2000	2	-	0.69	-	-	-
2001	10	12	2.30	2.48	0.18	3.85
2002	3	15	1.09	2.70	1.61	0.43
2003	2	17	0.69	2.83	2.14	0.32
2004	1	18	0	2.89	2.89	0.23
2005	18	36	2.89	3.58	0.69	1.00
2006	12	48	2.48	3.87	1.39	0.49
2007	33	81	3.49	4.39	0.90	0.70
2008	47	128	3.85	4.85	1.00	0.69
2009	67	195	4.20	5.27	1.07	0.64
2010	81	276	4.39	5.62	1.23	0.56
2011	70	346	4.24	5.84	1.60	0.43
2012	97	443	4.57	6.09	1.52	0.45
2013	109	552	4.69	6.31	1.62	0.42
2014	149	701	5.00	6.55	1.55	0.44
2015	155	856	5.04	6.75	1.71	0.40

Table 5 Authorship Pattern

Pattern	No. of Papers	Cum. papers	%
1	4	-	0.47
2	195	199	22.78
3	250	449	29.21
4	166	615	19.39
5	120	735	14.01
6	57	792	6.66
7	31	823	3.62
8	14	837	1.65
9	11	848	1.28
10	3	851	0.36
11	2	853	0.24
12	1	854	0.11
13	1	855	0.11
15	1	856	0.11
Total	**856**		**100**

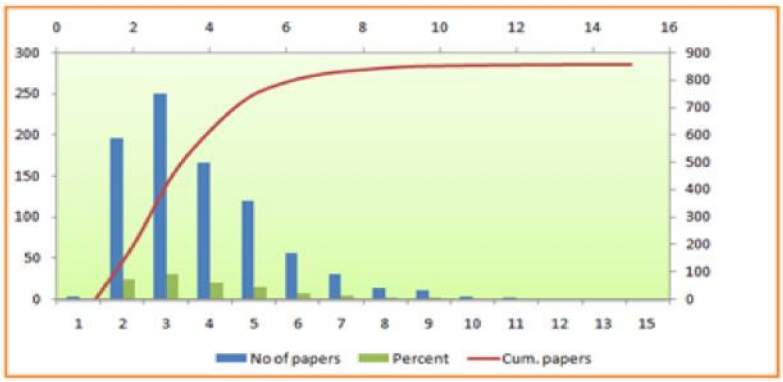

Fig.3 Authorship pattern

6.5 Degree of Collaboration

It can be identified from the below Table 6 that indicates the degree of collaboration in the scientific publications published by the faculty members of Periyar university during the period of study. To estimate the degree of collaboration, the formula suggested by K. Subramanyam (1983) was used for the present study.

The formula is: C = Nm/Nm+Ns

Where, C = Degree of Collaboration, Nm = Number of Multi Authored Contribution, Ns = Number of Single Authored Contribution

Therefore, the value of C is = 4/4+852 = 0.99.

The average degree of collaboration in "scholarly publications of Periyar University" is 0.99 which clearly depicts the dominance upon multi - authored contributions. The analysis of data identifies out of the total 856 scholarly articles published, 99.53 percent of them are published under collaborative pattern of publication among the faculty members in their research. It is observed that in the beginning (1998) there was no significant study after that the collaborative value has been increased between 0.96 and 0.99. The same study has already done by Radhakrishnan and Velmurugan and found that the same value i.e. 0.99 has identified during the period between 1998 and 2014.

Table 6 Degree of Collaboration

Year	Single Authors	Multi-authors	Total Output	DC
2000	0	2	2	1
2001	0	10	10	1
2002	0	3	3	1
2003	0	2	2	1
2004	0	1	1	1
2005	0	18	18	1
2006	0	12	12	1
2007	1	32	33	0.96
2008	1	46	47	0.97
2009	0	67	67	1
2010	1	80	81	0.98
2011	0	70	70	1
2012	0	97	97	1
2013	0	109	109	1
2014	1	148	149	
2015	0	155	155	1
Total	**04**	**852**	**856**	**0.99**
%	**0.47**	**99.53**	**100**	

6.6 Ranking of Collaborative Institutions

Table 7 examines that the ranking of collaborative institution based research papers which were collected from the web of science for the period 2000-2015. Of the 402 collaborative institutions, researcher has chosen for analysis only top 20 institutions with more than 10 research papers and the results revealed that most of the collaborative research articles were published Bharathiar University (4.3%) with 220 total global citations and ranked first and followed by Sri Sarada College Women Autonomous (3.9%) with 341citations which has ranked in the second and in the third place has occupied by National Institute of Technology, Anna University and Alagappa University were in the place of 5th and 6th and the global citations were 312, and 331 respectively. It was found that the most of the articles are shared by Bharathiar University and the scientists are eager to publish their research papers with Periyar University faculties.

Table 7 Ranking of Collaborative Institutions

Sl. No	Institution	Recs	Percent	TLCS	TGCS
1	Bharathiar University	37	4.3	34	220
2	Sri Sarada College Women Autonomous	33	3.9	31	341
3	National Institute of Technology	32	3.7	19	171
4	Abdus Salam Int Ctr Theoret Phys	31	3.6	58	225
5	Anna University	30	3.5	32	312
6	Alagappa University	23	2.7	7	331
7	Chonbuk Natl University	22	2.6	27	287
8	Govt Arts Coll Autonomous	21	2.5	18	223
9	Bharathidasan University	20	2.3	6	72
10	Univ Madras	19	2.2	46	127
11	Annamalai University	18	2.1	11	83
12	Cent Univ Tamilnadu	18	2.1	27	72
13	Chikkanna Govt Arts College	17	2.0	1	13
14	Sungkyunkwan University	17	2.0	21	280
15	King Saud University	10	1.2	4	26

6.7 International Collaboration

Table 8 represents that the thirty nine countries associated with the Periyar University worldwide sharing their publications and it is find out that the most of the research papers i.e. 53 (6.2%) of this university have been published in association with researchers of South Korea, and followed by Italy (39 papers), USA (27 papers), Poland (23 papers), Saudi Arabia (16papers), Germany (14 papers), Portugal (12 papers), Japan (11 papers), Malaysia and Spain (9 papers each), Egypt (8 papers), Finland and People R China (6 papers each), Austria (5 papers), France, Hungary, Serbia, Switzerland and UK (4 papers each), and the least one paper each published by Bangladesh, Brazil, Canada, Croatia, Czech Republic, Iraq, Macedonia, Oman, Russia, Taiwan, Ukraine and Vietnam respectively.

6.8 Most Prolific Authors

It can be seen from the Table 9 that the most prolific authors' publication activity of Periyar University which has been noted during the period of study. The results points out that the most top position in terms of publication of research papers has produced by Krishnakumar V with 118 (13.8%) articles and the total global citations are 1281 and the cited references are 94. The second position has received by Gopi D and Kavitha L with 87 (10.2%) papers each and the citations are 830 and 813 and the cited references are 301 and 303 respectively. Viswanathamurthi P has occupied the third rank with 58 (6.8%) papers and the global citations are 371 and the cited references are 120. Of the 30 most prolific authors, the small numbers of articles are published by Anbazhagan S and Balagurunathan R with 14 (1.6%) research papers based on the web of science database during the period of study.

6.9 Identification of Journal-wise Distributions

Of the 332 journals, research has chosen only top 25 most core journals for the analysis purpose during the period of study. Research has found that the rank based highly prolific journals are measures based on the literature output. The analysis shows that 'Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy' is the highest number of articles with 111 (13.0%) and the global citations are 1288 with 127 cited references has placed first rank, and followed by 'RSC Advances' is in the second rank with 22 records, 'Asian Journal of Chemistry' is in the third place with 17 records and 'Journal of Raman Spectroscopy' has occupied in the fourth rank with 16 records.

Table 8 International Collaboration

Sl. No	Country	Recs	Percent	TLCS	TGCS
1	South Korea	53	6.2	70	628
2	Italy	39	4.6	70	256
3	USA	27	3.2	22	150
4	Poland	23	2.7	36	168
5	Saudi Arabia	16	1.9	5	47
6	Germany	14	1.6	12	80
7	Portugal	12	1.4	31	78
8	Japan	11	1.3	28	117
9	Malaysia	9	1.1	3	15
10	Spain	9	1.1	3	31
11	Egypt	8	0.9	6	44
12	Finland	6	0.7	11	59
13	Peoples R China	6	0.7	1	30
14	Austria	5	0.6	8	16
15	France	4	0.5	6	43
16	Hungary	4	0.5	4	33
17	Serbia	4	0.5	4	17
18	Switzerland	4	0.5	4	18
19	UK	4	0.5	3	36
20	Algeria	3	0.4	0	12
21	Cameroon	3	0.4	0	7
22	Chile	3	0.4	1	2
23	Iran	3	0.4	4	15
24	Singapore	3	0.4	11	73
25	Slovakia	2	0.2	0	0
26	Turkey	2	0.2	1	9
27	Bangladesh	1	0.1	0	0
28	Brazil	1	0.1	0	0
29	Canada	1	0.1	0	5
30	Croatia	1	0.1	0	0
31	Czech Republic	1	0.1	0	0
32	Iraq	1	0.1	0	3
33	Macedonia	1	0.1	11	24
34	Oman	1	0.1	0	2
35	Russia	1	0.1	0	0
36	Taiwan	1	0.1	0	3
37	Ukraine	1	0.1	1	3
38	Vietnam	1	0.1	0	6
Total		**289**	**34.1**	**356**	**2030**

Table 9 Most Prolific Authors

Sl.No.	Author	Recs	%	TLCS	TLCS/t	TLCSx	TGCS	TGCS/t	TLCR
1	Krishnakumar V	118	13.8	112	15.87	21	1281	183.69	94
2	Gopi D	87	10.2	299	77.31	0	830	218.60	301
3	Kavitha L	87	10.2	281	74.41	0	813	218.79	303
4	Viswanathamurthi P	58	6.8	118	45.51	0	371	122.69	120
5	Anbarasan PM	50	5.8	33	6.43	1	256	46.58	35
6	Kumaradhas P	43	5.0	48	9.33	0	156	32.63	52
7	Nagalakshmi R	39	4.6	30	4.58	4	267	44.93	35
8	Palvannan T	39	4.6	51	11.37	1	338	73.64	45
9	Raj V	26	3.0	13	2.64	0	103	24.92	13
10	Velraj G	24	2.8	17	3.42	0	116	27.34	25
11	Sathishkumar P	23	2.7	49	10.90	1	302	64.75	26
12	Rajesh KB	22	2.6	26	5.02	0	97	20.97	26
13	Lalitha A	21	2.5	9	2.13	0	154	35.95	9
14	Perumal P	21	2.5	8	4.29	1	100	42.07	8
15	Sekar C	21	2.5	12	2.07	3	185	33.36	12
16	Mathammal R	20	2.3	15	2.93	4	131	25.29	27
17	Ramasamy AK	20	2.3	13	3.08	0	124	32.40	15
18	Prakash P	19	2.2	7	1.50	0	109	38.24	7
19	Thandapani E	19	2.2	0	0.00	0	75	5.32	0
20	Kannan S	18	2.1	25	6.23	0	111	47.67	21
21	Prabavathi N	18	2.1	19	3.26	1	243	40.55	26
22	Prakash G	18	2.1	37	20.58	0	89	54.42	44
23	Girija EK	17	2.0	30	7.10	7	171	45.18	22
24	Manikandan R	17	2.0	39	15.93	0	87	37.33	46
25	Shivakumar MS	17	2.0	5	4.00	0	19	12.33	4
26	Muthukumar M	15	1.8	24	3.65	0	86	13.60	13
27	Sakthivel R	15	1.8	17	2.68	0	228	49.75	17
28	Venkatachalam P	15	1.8	6	2.75	0	59	25.50	6
29	Anbazhagan S	14	1.6	11	2.41	2	34	11.00	9
30	Balagurunathan R	14	1.6	4	1.03	1	67	13.81	3

Table 10 Journal-wise Distributions

Sl. No	Journal	Recs	Percent	TGCS	TLCR
1	Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy	111	13.0	1288	127
2	RSC Advances	22	2.6	59	90
3	Asian Journal of Chemistry	17	2.0	4	6
4	Journal of Raman Spectroscopy	16	1.9	127	6
5	Journal of Molecular Structure	12	1.4	56	10
6	Optik	12	1.4	13	7
7	Physica Scripta	12	1.4	156	19
8	Materials Letters	11	1.3	62	5
9	E-Journal of Chemistry	10	1.2	55	1
10	Parasitology Research	10	1.2	28	5

11	Indian Journal of Pure & Applied Mathematics	9	1.1	8	0
12	Journal of Photochemistry and Photobiology B-Biology	9	1.1	42	6
13	Journal of the Indian Chemical Society	9	1.1	0	0
14	Journal of Coordination Chemistry	8	0.9	41	30
15	Carbohydrate Polymers	7	0.8	98	4
16	Computers & Mathematics with applications	7	0.8	86	2
17	Journal of Applied Electrochemistry	7	0.8	119	11
18	Journal of Environmental Biology	7	0.8	6	1
19	Journal of Optoelectronics and Advanced Materials	7	0.8	17	3
20	Journal of the Geological Society of India	7	0.8	17	3
21	Bulletin of Materials Science	6	0.7	12	10
22	Chinese Physics B	6	0.7	10	21
23	Computational and Theoretical Chemistry	6	0.7	19	7
24	Environmental Science and Pollution Research	6	0.7	5	2
25	Indian Journal of Geo-Marine Sciences	6	0.7	6	1

6.10 Funding Agencies

More than 300 funding agencies have involved for publishing research publications during the period of study. Out of 300, only top 15 funding agencies have been chosen for the analysis with more than 11 articles. It is inferred from the Table 11 that the maximum number of (4.907%) were contributed by the funding agency of UGC, New Delhi and ranked first and , followed by ICTP, Italy funded for 29 research papers with 3.388%, CSIR had funded for 26 papers with 3.037%, Periyar University has been funded for 17 research articles during the period of study.

Table 11 Funding Agencies

Sl. No	Funding Agencies	Records	%
1	UGC	42	4.907
2	ICTP Italy	29	3.388
3	CSIR	26	3.037
4	BRNS India	20	2.336
5	Periyar University	17	1.986
6	Council Of Scientific And Industrial Research CSIR New Delhi	16	1.869
7	Council Of Scientific And Industrial Research New Delhi	15	1.752
8	University Grants Commission UGC	14	1.636
9	CSIR India	14	1.636
10	University Grants Commission UGC New Delhi India	13	1.519
11	DST	12	1.402
12	Council Of Scientific And Industrial Research CSIR New Delhi India	12	1.402
13	University Grants Commission	11	1.285
14	Department of Science and Technology New Delhi India	11	1.285
15	CSIR New Delhi	11	1.285

6.11 Research Areas

Out of 45 research areas, researcher has taken into account for the analysis, only top most 25 different subjects. It can be seen from the below Table 12 and indicates that the highest number of research publications have published in the field of Chemistry with 26.986% and occupied in the first place, and followed by Spectroscopy with 15.187% has received in the second position, Physics with 14.603% and ranked in the third and the small proportion of 0.818% received by the subjects such as Toxicology and Research Experimental Medicine among the research areas. Based on the study, it can be observed that the highest numbers of research papers were published in the subject of Chemistry as predominant.

Table 12 Research Areas

Sl. No	Research Areas	Records	%
1	Chemistry	231	26.986
2	Spectroscopy	130	15.187
3	Physics	125	14.603
4	Materials Science	109	12.734
5	Mathematics	65	7.593
6	Engineering	47	5.491
7	Biochemistry Molecular Biology	43	5.023
8	Environmental Sciences Ecology	41	4.79
9	Optics	34	3.972
10	Biotechnology Applied Microbiology	27	3.154
11	Crystallography	26	3.037
12	Science Technology Other Topics	25	2.921
13	Computer Science	25	2.921
14	Polymer Science	23	2.687
15	Pharmacology Pharmacy	23	2.687
16	Biophysics	20	2.336
17	Geology	19	2.22
18	Parasitology	15	1.752
19	Electrochemistry	15	1.752
20	Water Resources	11	1.285
21	Metallurgy Metallurgical Engineering	10	1.168
22	Mechanics	9	1.051
23	Agriculture	9	1.051
24	Toxicology	7	0.818
25	Research Experimental Medicine	7	0.818

7. FINDINGS AND CONCLUSION

Some significant findings based on the study during the period are:

- The maximum numbers of (18.1%) of articles were published in 2015 with 126 global citations, and the lowest number 0.2% of research papers was published in 2000 and 2003 respectively.
- It is found that among the thirty nine countries, South Korea is the top country to sharing of their publications with Periyar University.
- The maximum number of research papers has produced by Krishnakumar V with 118 (13.8%) articles and the total global citations are 1281 and the cited references are 94. The second position has received by Gopi D and Kavitha L with 87 (10.2%) papers each.

- The journal 'Spectrochimica Acta Part A-Molecular and Bimolecular Spectroscopy' is the highest number of articles with 111 (13.0%) and placed in the first rank.
- The maximum number of (4.907%) were contributed by the funding agency of UGC, New Delhi and ranked first.
- The highest number of research publications have published in the field of Chemistry with 26.986% and occupied in the first place.
- The average degree of collaboration in "scholarly publications of Periyar University" is 0.99 which clearly depicts the dominance upon multi - authored contributions.

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Mapping of Research Productivity in VIT University: A Scientometric Study

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Abstract

This paper discusses about the published research articles and its citation available in the Indian Citation Index by the authors from VIT University for the period 2004-2015. The relevant data are collected from Indian Citation Index and it was analyzed. It shows among the 1425 articles, maximum of 480(33.69%) articles published in 2015 and minimum of 10(0.7%) articles published in 2006. Based on the citation during the period 653 citations were made. Among the 653 Citations, maximum of 128 citations in 2012 and minimum number of citations 13 in 2005, was identified.

Keywords: *Citation Analysis, Mapping, Research Productivity ICI, Scientometric, VIT University, Year- wise Distribution*

1. INTRODUCTION

The true barometer of assessing the quality and quantity of a journal is the Citation Index. While discussing citation, one needs to understand the citation .Simply, when another refers other works in his/her article, we call the article referred is cited. In other words the citation is called as the previous work which is referred in the present work. The quality of a given work can rightly be adjudged through the number of citations that it gets. Therefore, a certain piece of article or research paper is carrying more number of citations get more impact than the work carrying less citation. Therefore, we always refer to some indexing and abstracting databases like Scopus, Web of Science, or even Google Scholars to know the impact of a journal, a particular article or a particular author. Indian Citation Index which was initiated by Diva Enterprises is just an indexing and abstracting database.

2. REVIEW OF LITERATURE

Nicholas and Ritchie (1978) [1] view that, "study of bibliometrics concept provides information, knowledge and how it is communicated". Moreover, bibliometric studies are normally employed to evaluate the academic research output, the quality of the journal, impact and influence of articles, authors, and assorted parameters. Though there has been substantial growth of literature on bibliometric studies during the last decade, the authors focus on some of the pertinent literature that relate to the present study. Potter (1981) [2] defines bibliometric analysis as "the calculation and study of the research publication patterns of all types of written communication and their authorship nature". In a most interesting study Mooghali , et al. (2011) [3] analyzed records of three premiere indexes known as , "SSCI", "SCI", and "AHCI", and it is projected in the field of "scientometrics" evolved between 1980 to 2009. The pattern of growth of literature in the field of Nanoscience during 1990 to 2009 was reported by Karpagam et al. (2011) [4] .In the similar vein, Abramo (2011) [5] exercised bibliometric techniques on some national level research assessment. Lapon-Kandeishein and Prebor (2011) [6] bibliographical research on Hebrew printing also needs mention. In the similar light bibliometric studies by veterans like Krampen, Eye and Schui (2011) [7], Kumar Suchetan(2012) [8] and others also presented findings on different directions. Dhanavandan and Tamizhchelvan (2014) [9] studied citations and research productivity of south Tamil Nadu universities from 2009 to 2013 based on Indian Citation Index (ICI)

3. METHODOLOGY

This study aims to discuss about the analysis of the citation index of the research output by faculty members of VIT University. The relevant sources and data are collected from Indian Citation Index [10]. Based on the available sources the following discussions are made.

4. ANALYSIS AND INTERPRETATION

The distributions of the research output by the authors from VIT University that are available in Indian Citation Index were analyzed in the table 1.

4.1 Year -wise Distribution of Published Articles VS Citations

Table 1 shows that the year-wise distribution of articles published by the various authors from VIT University. From 2004 to 2015, 1425 articles were published which are indexed in Indian Citation Index. Among the 1425, maximum of 480(33.69%) articles published in 2015 and minimum of 10(0.7%) articles published in 2005. Based on the citation during the period 653 citations were made. Among the 653 Citations, maximum of 128 citations in 2012 and minimum number of citations 13 in 2005 was identified.

Table 1 Year -wise Distribution of Published Articles Vs Citations

Sl. No.	Year	Articles	%	Citation	%	Citation	Article /
1	2004	25	1.75	29	4.44	1.160	1
2	2005	10	0.70	13	1.99	1.300	1
3	2006	23	1.61	21	3.22	0.913	1
4	2007	16	1.12	17	2.60	1.063	1
5	2008	17	1.19	30	4.59	1.765	1
6	2009	26	1.82	31	4.75	1.192	1
7	2010	91	6.39	99	15.16	1.088	1
8	2011	144	10.11	74	11.33	0.514	2
9	2012	116	8.14	128	19.60	1.103	1
10	2013	216	15.16	123	18.84	0.569	2
11	2014	261	18.32	28	4.29	0.107	9
12	2015	480	33.69	60	9.19	0.125	8
	Total	**1425**	**100**	**653**	**100**	**10.899**	**29**

4.2 Year-wise Distribution of Cited Articles& Cited Density

Table 2 presents the year -wise distribution of Cited articles, Cited density and Article/ Cited articles published by the various authors from VIT University. From 2004 to 2015, 283 cited articles were available which are indexed in Indian Citation Index. Among the 283 cited articles maximum of 71(25.09%) in 2013 and minimum of 2(0.71%) cited articles in 2008.Based on the cited density during the period maximum of 0.385 in 2009 and minimum number of 0.085 in 2015, was identified.

Table 2 Year -wise Distribution of Cited Articles& Cited Density

Sl. No.	Year	Cited Articles	%	Cited Density	Article/Cited Articles
1	2004	7	2.47	0.280	3.571
2	2005	3	1.06	0.300	3.333
3	2006	8	2.83	0.348	2.875
4	2007	6	2.12	0.375	2.667
5	2008	2	0.71	0.118	8.500
6	2009	10	3.53	0.385	2.600
7	2010	30	10.60	0.330	3.033
8	2011	38	13.43	0.264	3.789
9	2012	44	15.55	0.379	2.636
10	2013	71	25.09	0.329	3.042
11	2014	23	8.13	0.088	11.348
12	2015	41	14.48	0.085	11.707
	Total	**283**	**100**	**3.281**	**59.101**

4.3 Author-wise Distribution of Articles and Citations (Top 15)

Table 3 reveals that the author-wise distribution of the articles published and citations are available in the Indian Citation Index. Only we consider in the top fifteen authors. Among the 15, Suneetha V occupied the first position with 45 articles and 23 citations followed by author Mukherjee Amitava in the second position with 35 articles and 50 citations and Himaja M in the third position with 34 articles and 10 citations (Ranked by Articles only). In the case of highest citations Mukherjee Amitava is in the first position with 50 citations and Chandrasekaran N occupies the second position with 49 citations and Kumar Gaurav occupies the third position with 45 citations.

Table 3 Author-wise Distribution of Articles and Citations (Top 15)

Sl. No.	Author	Articles	Citation	Citation Density
1	Suneetha V	45	23	0.511
2	Mukherjee Amitava	35	50	1.389
3	Himaja M	34	3	0.294
4	Chandrasekaran N	32	49	1.485
5	Karthikeyan S	31	21	0.677
6	Kalainathan S	31	3	0.097
7	Abraham Jayanthi	27	3	0.107
8	Das Nilanjana	26	10	0.385
9	Mohanasrinivasan V	24	10	0.417
10	Kumar Gaurav	24	45	1.731
11	Shanthi V	24	5	0.208
12	Rao K V Bhaskara	23	18	0.783
13	Ramanathan K	22	5	0.227
14	Vijayalakshmi S	21	8	0.381
15	Jeeva P A	20	9	0.450

4.4 Subject -wise Distribution of Articles and Citations (Top 15)

Table 4 presents the top 15 subjects it includes various articles published and cited from the VIT University that are available in the Indian Citation Index. As per the sources available in the Indian Citation Index. Among the articles 636 from Pharmacology & Pharmaceutical Science is in the first rank, 452 articles from Chemistry with second rank and 251 articles from Engineering Science & Technology subject in third rank were identified. It is revealed from the table that Pharmacology & Pharmaceutical Science subject has the highest citations 381 when comparing to other subjects.

4.5 Distribution of Top 15 Cited Journals

Table 5 shows the top 15 journals articles published and cited by authors in VIT University. Among the top 15, International Journal of Chemtech Research occupies the first place with 165 articles the second place in Indian Journal of Science &Technology with 140 articles and the third place in International Journal of Pharmacy & Pharmaceutical Sciences with121 based on the article publications. Based on the citation International Journal of Pharmacy & Pharmaceutical Sciences occupies the first position with 135citations and Journal of Pharmacy Research is in the second position with 57 citations and Indian Journal of Science &Technology is in the third position with 56 citations.

Table 4 Subject -wise Distribution of Articles and Citations (TOP 15)

Sl. No.	Subject Category	Articles	Citation
1	Pharmacology & Pharmaceutical Science	636	381
2	Chemistry	452	76
3	Engineering Science & Technology	251	50
4	Biological Science	179	69
5	General Science & Technology	169	109
6	Health Science	133	47
7	Environmental Science	61	28
8	Biotechnology	58	40
9	Computer Science & Technology	38	2
10	Mathematics	28	3
11	Statistics	27	3
12	Pollution	26	4
13	Physics	21	16
14	Material Science	19	10
15	Agriculture	10	2

Table 5 Distribution of Top 15 Cited Journals

Sl.No.	Publications	Articles	Citation
1	International Journal of Chemtech Research	165	32
2	Indian Journal of Science &Technology	140	56
3	International Journal of Pharmacy & Pharmaceutical Sciences	121	135
4	Journal of the Indian Chemical Society	114	4
5	Research Journal of Pharmaceutical, Biological &Chemical Sciences	101	19
6	Journal of Pharmacy Research	89	57
7	International Journal of Pharmaceutical Sciences: Review & Research	55	23
8	Journal of Chemical & Pharmaceutical Research	53	9
9	International Journal of Drug Development & Research	45	22
10	Research Journal of Pharmacy & Technology	42	8
11	Asian Journal of Pharmaceutical & Clinical Research	38	12
12	Asian Journal of Chemistry	29	4
13	International Journal of Engineering Science & Technology	28	8
14	International Journal of Pharmtech Research	23	4
15	International Journal of Pharmacy & Technology	23	0

4.6 Distribution of Document Type

Table 6 expresses the distribution of document type based on the articles published from VIT University. It shows among the 1425 articles, which includes 1275(89.48%) Research Articles, 104(7.30%) Review Article and 19(1.33%) Short communication type. Among the 653 Citations, this includes 516(79.02%) Research Articles type followed by 58(8.88%) Short Communication type and 53(8.12%) from Review articles. It is concluded that the highest articles and citations are from research article type of documents.

Table 6 Distribution of Document Type

Sl. No.	Document Type	Articles	%	Citation	%
1	Research Article	1275	89.48	516	79.02
2	Review Article	104	7.30	53	8.12
3	Short Communication	19	1.33	58	8.88
4	Research Note	11	0.77	24	3.68
5	Editorial	8	0.56	2	0.30
6	Case Study	6	0.42	0	0
7	Research Method	2	0.14	0	0
	Total	**1425**	**100**	**653**	**100**

5. CONCLUSION

Indian Citation Index to offer an easy-to-use, reliable bibliographic and citation database to users. During the study period among the published articles 1425, maximum of 480(33.69%) articles published in 2015 and minimum of 10(0.7%) articles published in 2005. Based on the citation during the period 653 citations were made. Among the 653 Citations, maximum of 128 citations in 2012 and minimum number of citations 13 in 2005, was identified.The present study shows that most of the years the number of articles publication is increasing gradually. It reflects that the Authors interest and involvement in Research field. The cited articles study reveals that among the 283 cited articles maximum of 71(25.09%) in 2013 and minimum of 2(0.71%) cited articles in 2008.Based on the cited density during the period maximum of 0.385 in 2009 and minimum number of 0.085 in 2015, was identified. The Author Wise Distribution of Articles and Citations study tells that the author Suneetha V occupied the first position with 45 articles and 23 citations followed by author Mukherjee Amitava in the second position with 35 articles and 50 citations and Himaja M in the third position with 34 articles and 10 citations (Ranked by Articles only). In the case of highest citations Mukherjee Amitava is in the first position with 50 citations and Chandrasekaran N occupies the second position with 49 citations and Kumar Gaurav occupies the third position with 45 citations. The Subject wise distribution of cited articles study reveals that 636 articles from Pharmacology & Pharmaceutical Science is in the first rank, 452 articles from Chemistry with second rank and 251 articles from Engineering Science & Technology subject in third rank were identified. It is revealed from the table that Pharmacology & Pharmaceutical Science subject has the highest citations 381 when comparing to other subjects. The Distribution of Top 15 Cited Journals depicts that, International Journal of Chemtech Research occupies the first place with 165 articles the second place in Indian Journal of Science &Technology with 140 articles and the third place in International Journal of Pharmacy & Pharmaceutical Sciences with121 based on the article publications. Based on the citation International Journal of Pharmacy & Pharmaceutical Sciences occupies the first position with 135citations and Journal of Pharmacy Research is in the second position with 57 citations and Indian Journal of Science &Technology is in the third position with 56 citations. The distribution of document type study shows that among the 1425 articles, which includes 1275(89.48%) Research Articles, 104(7.30%) Review Article and 19(1.33%) Short communication type. Among the 653 Citations, this includes 516 (79.02%) Research Articles type followed by 58(8.88%) Short Communication type and 53(8.12%) from Review articles. It is concluded that the highest articles and citations are from research article type of documents.

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User Interfaces of Digital Library and its Functions

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Abstract

As accepted agenda libraries are acceptable added complex, the accessories provided by them will admission and the adversity of acquirements associated with the complication of application these accessories will as well increase. In adjustment to aftermath accessible and advantageous alternate systems, this is the presentation about the user interface of Agenda library and its architecture decisions are discussed.

Keywords*: Accoutrement Information, Agenda Library, Digital, Library, Internet*

1. INTRODUCTION

Since 1980, the boundless deployment of Internet and advice technology has had a abysmal appulse on people's circadian life, including their way of work, study, and living. The Internet is acceptable an important advice approach a part of the people. The Internet has as well accustomed bearing to the abstraction of agenda libraries, a new anatomy of managed advice administration and account provision. A user interface for agenda libraries accept to affectation ample volumes of abstracts effectively. Typically the user is presented with one or added overlapping windows that can be resized and rearranged. In agenda libraries, a ample bulk of abstracts advance through a amount of assets necessitates automatic interfaces for users to concern and retrieve information. The adeptness to calmly change the user's angle from high-level summarization advice down to a specific branch of a certificate or arena from a blur charcoals a claiming to user interface researchers.

The abreast technologies like XML databases; Internet and Web 2.0 are accoutrement an accomplished ambiance to advertise the multi-media advice to the accepted man by breaking the concrete abuttal's barriers. These avant-garde technologies accept enabled all-around connectivity of computers and the development of assorted accoutrement and technologies for networked advice accoutrement and access. Agenda Libraries (DL) accommodate an basement for creating, structuring, storing, organizing, processing, retrieving, and distributing multimedia agenda advice via Internet. Agenda libraries are not acclimated in isolation, they are congenital up with abounding apparatus – User Interface is one of the above apparatus that affect its use.

The user interface system, has acquired abundant application due to the actuality that it affects the usability, which is a key agency for the success of a product. The bartering and abstruse appeal of the user interface is now able-bodied accustomed in the computer science analysis community, and abounding conferences and projects all over the apple accord alone with animal factors and user interface issues. Still accessible problems abide in this area, and they are added if developing for agenda libraries.

2. REQUIREMENT FOR AGENDA LIBRARIES

The Internet and Apple Wide Web accommodate the catalyst and abstruse ambiance for the development and operation of a agenda library. The Internet provides the TCP/IP and or its associated agreement for accessing the advice and web accommodate accoutrement and address for publishing the advice over Internet. In the agenda ambiance it is reasonable to say that a axial aback up or annual should be created at the civic level, which will abundance advice output of the arena as able-bodied advice from out ancillary the country. Some of the claim for agenda libraries is:

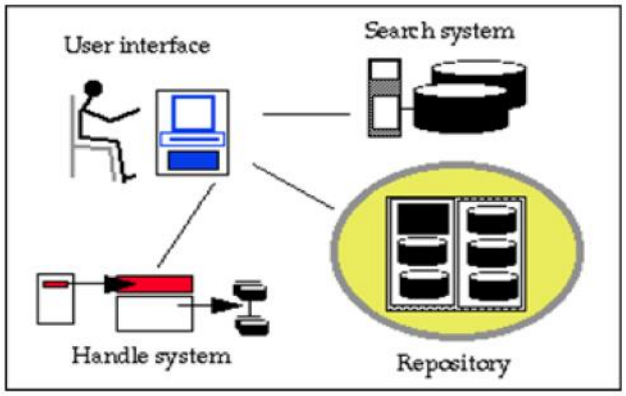
1. Audio visual: Colour T.V., V.C.R., D.V.D., Sound box, Telephone etc.
2. Computer: Server, P.C. with multimedia, U.PS. Etc
3. Network: LAN, MAN, WAN, Internet etc.
4. Printer: Laser printer, Dot matrix, Barcode printer, Agenda clear printer etc
5. Scanner: H.P. Scan jet, flatbed, Sheet feeder, Drum scanner, Slide scanner, Microfilming scanner, Agenda camera, Barcode scanner etc
6. Accumulator devices: Optical accumulator device, CD-ROM, Jukebox etc.

7. Software: Any acceptable software, which is committal and acceptable for LAN and WAN connection.

3. USER-CENTERED DESIGN

User-centered architecture for a agenda library have to cover not alone systems appraisal but as well and compassionate of the action of advice gluttonous and use. Compared to a "self-evident aperture handle" - already you see it, you apperceive what it does and how to use it. No apprenticeship is necessary Layout and design

- The accomplished point of a graphical user interface is to back added advice to the user in a abbreviate time.
- The GUI have to abutment the user needs
- Example problems in the NCSTRL (Networked Computer Science Technical Reports Library) evaluation
- Menu choices - no analytic order
- Reorganize by assignment or functionality
- Organize assignment interfaces by categories to present a structured arrangement archetypal and abate cerebral workload. Architecture of User Interface of Agenda Library



A user interface aperture provides a human-centered admission point to the functionality of the amalgamated agenda library. Each user interface aperture uses the advice provided by one or added accumulating servers to admittance analytic for and admission to altar aural those collections. User interface gateways as well use advice provided by accumulating servers and basis servers to accomplish concern acquisition decisions based on factors such as content, cost, performance, and the like. Thus, the aperture provides a simple apparatus for users (through the browser of their choice) to accretion admission to the array of NCSTRL casework in a constant manner.

4. HOME PAGES

A aboriginal aloft accommodation admired the arrangement Home Page(s), i.e. the antecedent admission points. In accession to the altered types of users listed above, we accept aswell had to accede two added dimensions: accessible vs. private;

• Centralised vs. local.

• The Bounded Home Page interface caters accompanying for two user classes: advice users and advice providers by alms two capital options: search/ browse any collection; submit/withdraw a certificate to/ from a bounded collection. This accommodation was taken to facilitate the bounded user.

5. SEARCH INTERFACE

The accepted seek interface to a agenda library arrangement is of abundant accent as the seek action is the operation a lot of frequently invoked by the users. The arrangement appropriately tends to be advised on the claim of this interface: it accept to accommodate all all-important capabilities yet be easy-tounderstand and easy-to-use.

5.1 Submission Interface

In adjustment to abide a new certificate to one of the collections which anatomy allotment of the DL, the certificate acquiescence anatomy or bibliographic almanac accept to be completed. For convenience, it was absitively that the authors of abstracts should abridge their own bibliographic annal and abide these calm with the argument file(s) to the system. The architecture of this interface was appropriately acutely important. It was not acceptable to accommodate on-line helps and admission to the allocation schemes with «cut» and «paste» mechanisms to access descriptors on the acquiescence anatomy after the accident of typos.

5.2 Lessons Learned

It is apparently accurate to say that a lot of the acquaint we accept learnt from this acquaintance are anticipated from the abstract and, at a aboriginal glance, may arise all too obvious. However, it is one affair to recognise the actuality of a botheration theoretically; it is absolutely addition adventure to accept to apparatus real-world solutions to this problem. A amount of factors may able-bodied affect the decisions taken.

5.3 User Interface Layout example

- Instead of about ordered tabs, accumulation them by
- User tasks
- Simple search
- Advanced search
- Browse
- Register
- Submit abstruse letters to CoRR

5.4 Graphical design

- Proximity of elements suggests associations and relatedness. Seek button actual abutting to OR radio box. Applies appropriately to all locations of the dialog
- Consider the implications of adjustment and affiliation of graphical elements.

5.5 The Claiming in User Interface

- A user interface for agenda libraries have to affectation ample volumes of abstracts effectively.
- Typically the user is presented with one or added overlapping windows that can be resized and rearranged.
- In agenda libraries, a ample bulk of abstracts advance through a amount of assets necessitates automatic interfaces for users to concern and retrieve information.
- The adeptness to calmly change the user's angle from high-level summarization advice down to a specific branch of a certificate or arena from a blur charcoal a claiming to user interface researchers.
- Searching, filtering, browsing, User view: all are aspects of award a bare resource, Developer view: differences based on what have to go in an basis to abutment searching, how clarification is accumulated with analytic to anatomy a new query, etc.
- Usability suggestion: amalgamate search, browse, clarify into one another and aeronautics facility. Give users the ability to amalgamate these elements to serve their needs.

6. NEW PARADIGMS OF ACCURATE INFORMATION

The way advanced on accessible admission to accurate publications. Acknowledged and applied barriers to abstracts mining initiatives and means to affect these barriers. Experiments should be conducted with other methods of associate assay and with abstracts mining of the abounding argument of accurate articles.

7. DATA SHARING

Appropriate rewards for advisers who allotment their data. Implementation of abstracts assay mandates by Assay Allotment Organisations. Experiments should be conducted with the aim to advance abstracts journals.

8. DIGITAL PRESERVATION

Legal drop of agenda accurate advice in the EU. Responsibilities of civic and assay libraries for attention accurate advice as allotment of their role and tasks in the agenda age, and accompanying allotment needs. Mechanisms for allotment agenda canning of assay by assay allotment organisations (support for the canning basement as able-bodied as for one-off tasks).Experiments should be conducted at Community akin with a appearance to ensuring the superior and abidingness of repositories and to advance a framework for assay and acceptance of these repositories.

9. VIDEO AGENDA LIBRARIES

Video agenda libraries action added challenges for interface design, Advice attributes are added complex, visual, audio, added media, Indicators and authoritative widget, Start, stop, reverse, jump to beginning/end, seek a accurate anatomy or a anatomy with a defined characteristic Famous User Interfaces of Agenda Library

- Centre for Education and Documentation: www.ced.org
- IGNCA Agenda Library: www.ignca.nic.in/dgt_0001.htm
- CSCS Media and Culture Archive: http://www.cscsban.org/html/media_archive.htm
- INFLIBNET: Advice and Library Network Centre: www.inflibnet.ac.in
- http://www.artistudio.narod.ru/india_in_nature/schools/page_01.htm
- Digital South Asia Library: http://dsal.uchicago.edu
- TIFR Agenda Library Initiative: www.tifr.res.in/~library/

10. CONCLUSION

The accretion acceptance of agenda libraries poses a new claiming for user interface development. Designing a user interface involves abounding professionals such as software engineers, clear designers, animal agency

specialists, and abstruse writers, and as well actual generally statistical consultants, all of whom abet to accommodate the activity goals. The attempt presented in this cardboard is not alone constant with ambition user needs, but it is as well content-dependent and complete for accustomed agenda libraries. Although the archetypal refers to agenda libraries, it can be continued with added appearance to added cross-language advice systems on the Web and appropriate purpose agenda libraries (medical, legal, bounded etc). Goals of user interface support requirements assay and specification organise the information, abstraction graphical aspects and even, appraise the account of the system.

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Citation Analysis on Asia Pacific Journal of Management

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Abstract

Citation analysis of Asia Pacific Journal of Management" from 2001 to 2005 is carried out. 121 articles are published in the journal during 5 years. Highest numbers (27) of articles are published in the year 2001. The journal contained 7584 citations. Average number of citation per article is 64. This study also covers the analyses of authorship patterns in citing article. In authorship pattern, Single authored citations are dominant than others and it is 44.91%. The study finds out the author self citation and journal Self citation.

Keywords: Author self citation, Citation analysis, Journal Self citation

1. CITATION ANALYSIS

Citation analysis retains the identity of individual article in the context of its citations included in its bibliography. While citation analysis is restricted to each article and the bibliography of citations appended to it, the analysis of bibliographic records is known as Bibliometrics. Bibliometric studies reveal a wide range of results leading to inferences regarding even the future Nobel laureates. Such studies dealing in depth of bibliographic apparatus led to the evolution of a field called "Bibliometrics"[1].

The references cited by these 121 contributions have been taken up for analysis and discussion. Data on the type publication cited a distribution over the volumes along with their percentage and other details such as the number of citations and their distribution author –wise and the age and type of citations form part of it.

2. SCOPE

In this present study 7584 citations appended to 121 articles appeared in Asia Pacific Journal of Management published from 2001 to 2005 have been analysed. The issue numbers 18 to 22 have been covered in this study.

3. OBJECTIVES

The main objectives of the study is find out the

i. Over all references.
ii. Bibliographical sources of citations.
iii. Authorship pattern
iv. Percentage of the author self citation
v. Percentage of the Journal self citation

4. METHODOLOGY

The data has been compiled from online journal articles. For each article following data has been noted: Number of articles, Number of Citations, Number of authorship, bibliographical sources and other data required for the study. All the necessary information were compiled, recorded, tabulated and analyzed for making observations as indicated in the objectives of the study.

5. DATA ANALYSIS AND INTERPRETATION

5.1 Year-wise Distributions of Citations

There has been tremendous increase in the review literature by the scientists. Overall distribution pattern of citation in 'Asia Pacific Journal of Management' during the period 2001 to 2005 in 20 issues of 5 volumes is 7584. Table 5.1 represents the year-wise distribution of citation during the period of study. It reveals that a total of 7584 citations are appended to 121 articles. The number of citations per year varied from a minimum of 1334 citations to a maximum of 1664 citations. The average number of citations per article is calculated as 64.

Table 5.1 Year-wise Distributions of Citations

Year	Vol. No.	No. of Articles	No. of Citations	Average Citations Per Contributions	%	
					Reference	%
2001	18	27	1536	57	1536	20.25
2002	19	26	1518	58	1518	20.02
2003	20	24	1532	64	1532	20.21
2004	21	24	1664	69	1664	21.94
2005	22	20	1334	67	1334	17.58
Total		**121**	**7584**	**64**	**7584**	**100**

5.2 Form-wise and Year-wise Distribution of Cited Citations

Table 5.2 represents the data on the distribution of cited citations by types in 20 issues of the source journal with a total of 7584 citations. The authors refer to their research through various cannels like APJM Journals, Other Journals, Books, Proceedings, Thesis, Bulletin, Reports, Annual Reports, and E-Resources. This table presents a complete scenario of different forms of periodical forms and non-periodical literature, which are referred by the authors. Table 5.2 represents year-wise distribution of individual sources from 2001-2005. As found in any other discipline, in the present study also, major portions of the citations are from others Journals. The Journals rank first in order, showing 66.61 percent of the total number of citations. It that APJM Journals occupy 1.37 percent and Other Journals occupy 65.24 percent. The source of Books comes to third in order sharing 30.84 percent of total citations during the study period of study.

Table 5.2 Form -wise and Year-wise Distribution of Cited Citations

Form	2001	2002	2003	2004	2005	Total	%
APJM Journals	15	19	20	1	49	104	1.37
Other Journals	978	967	916	1065	1022	4948	65.24
Books	479	506	551	574	229	2339	30.84
Proceedings	49	11	18	7	8	93	1.23
Thesis	1	2	8	0	3	14	0.18
Bulletins	7	9	6	5	6	33	0.44
Annual Reports	6	2	0	0	0	8	0.11
E-Resources	1	2	13	12	17	45	0.59
	1536	**1518**	**1532**	**1664**	**1334**	**7584**	**100**

5.3 Web Resources Vs Printed Sources

Citation analysis of 'Asia Pacific Journal of Management' published during the study period 2001 to 2005 shows that 0.59 % of articles published during this period have web references. Out of 7584 references, 99.41 % of references are printed sources and 0.59% of them are web references.

Table 5.3 Web Based Sources Vs Printed Sources

Form	No. of Citations	%
Printed Sources	7539	99.41
Web Resources	45	0.59
Total	**7584**	**100**

5.4 Author-wise Distribution of Citations

The aim of the study of authorship pattern is to bring out the contribution pattern in a discipline. The authors are classified according to their citations that they have published. The total references cited by scientists are calculated to 7584 over the study period. It could be noted that Single authored citation rank first in order sharing 44.91 percent of the total citations. The year wise analysis shows that the performance of Single authored citations is better in almost all the years.

Table 5.4 Author-wise Distribution of Citations

Pattern	2001	2002	2003	2004	2005	Total	%
Single	741	640	669	827	529	3406	44.91
Two	519	568	490	571	494	2642	34.84
Three	167	203	210	181	214	975	12.86
Four	29	65	65	32	69	260	3.43
Five	7	13	26	9	8	63	0.83
Six	3	1	3	1	2	10	0.13
More than Six	1	5	5	0	1	12	0.15
Unknown	69	23	64	43	17	216	2.85
Total	**1536**	**1518**	**1532**	**1664**	**1334**	**7584**	**100**

5.5 Year-wise Distribution Author Self Citation

According to **Weinstocks**, there are some reasons for an author to 'Cite' another author's work or his own work to give credit for a related work; to correct the work of others; to correct one's own work. Here author self-citation is recorded in table 5.5.Table 5.5 shows data on year-wise distribution of author self-citations. The year 2003 has the highest number of the author citations and attains the first rank accounting 8.33 % and the overall author self-citation is 25.18 %. This indicates the authors are more interested to cite their own work.

Table 5.5 Year-wise Distribution Author Self Citation

Year	No. of Contributions	No. of Author Self Citations	%
2001	27	0	0
2002	26	2	7.69
2003	24	2	8.33
2004	24	1	4.16
2005	20	1	5
Total	**121**	**6**	**25.18**

5.6 Year-wise Distribution of Journal Self Citation

Whenever journal cites any of its previous publications, the journal self -citation occurs. Journal self-citation (JSC) substantially influences the impact factor of the concerned journal. This means high percentage of JSC not only enhances the impact factor of the corresponding journal but also indicates the relevance of the content of the journal to the scientific community using it. Table 5.6 records the volume-wise distribution of Journal Citation .It is noted that the year 2005 comes in first order of JSC accounts to 60 %. The second rank is attained by 2001 & 2003 by accounting 33.33 % .The overall Journal Self Citation is 35.53 %. of the journal possibly indicates that the journal commands great repute in its own field and attracts articles pertaining to the high profile areas of research. From the table we know that the author self-citation dominates the Journal self-citation.

Table 5.6 Year-wise Distribution of Journal Self Citation

Year	No. of Contributions	No. of Journal Self Citations	%
2001	27	9	33.33
2002	26	8	30.76
2003	24	8	33.33
2004	24	6	25
2005	20	12	60
Total	**121**	**43**	**35.53**

6. CONCLUSION

Bibliometrics is a branch of Library and Information Science. Bibliometric analysis counts up on bibliographic information on literature output. The periodical article is one of the attributes to research and development in various disciplines. Without any exemption the information scene in every discipline has been suffering from a major barrier known as "information explosion", which is taken to be a synonym to knowledge explosion.

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Information and Communication Technology in University Libraries

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Abstract

The advancement of science and technology has fabricated an amazing advance and change about in all walks of life. Especially the alluring chat Advice technology has been chanted in all corners of the all-around arena. The cardboard highlights the alteration ambit of library casework due to the appulse of ICT. The assorted aspects of agenda library, its purpose and advantages are talked about. The lot of capital appearance such as infrastructure, agent's abutment and bread-and-butter aspects are as well discussed with account to Indian context.

Keywords*: Communication Technology, Development Technology Services, Facilities, Information.*

1. INTRODUCTION

The advancement of science and technology has fabricated an amazing advance and afflicted about all walks of life. Especially, the alluring chat Advice technology has been chanted in all corners of the all-around amphitheatre and been absorb in organizational, managerial, adorning and business sectors. The casework rendered with the advice of ICT is faster and added effective. Moreover, it creates acceptance and aplomb about the online writing and casework of an alignment a allotment of its customers.

2. ICT AND LIBRARIES

Libraries which were advised alone as the storehouses of knowledge, accept got a new angle in the avant-garde Advice Communication Technology era. The activities which were agitated out manually in libraries with so abundant of affliction and ache are getting agitated out calmly with the advice of ICT with greater effectiveness. Library organization, administering and added abstruse processing accept become easier and added breakthrough of plan can be done in airy mood. ICT, which is the base for the MBO, generates added after-effects at a accustomed time.

3. UNIVERSITY LIBRARIES IN THE ICT ERA

University libraries are not the absolution from the appulse of ICT. Such libraries are actual abundant absorption in accumulation the latest ICT in their authoritative functions, abstruse works and user services. University Grants Commission abundantly contributes the grants to the university and added affiliated colleges to install the ICT accessories and accomplish a agenda ambiance

4. MEANING OF AGENDA LIBRARY

An agenda library is a library consisting of agenda abstracts and services. Agenda abstracts are items are stored, candy and transferred via agenda (binary) accessories and networks. Agenda casework is casework (such as advertence assistance) that is delivered digitally over computer networks. It maintains all, or an abundant part, of its accumulating in computer-accessible anatomy as alternative, supplement, or accompaniment to the accepted printed and microform abstracts that currently boss library collections.

5. PURPOSE

The purpose of agenda library is to facilitate admission to cyber banking information, book material, and library casework to ensure that the advice needs of user association are met, behindhand of their location. It enables libraries to bear admired advice that already exists aural library walls electronically to assemblage alfresco those walls, to actualize new agenda assets locally, and to accommodate bounded agenda assets with bound ones. The amount of humans accessing agenda collections admitting the WWW as well shows atomic ante of growth. Finally, internationalization is authoritative a "global advice environment" a reality.

5.1 The Purpose Agenda Library is to Provide

i Interaction with abeyant advice users;

ii Interaction with advice resources: and
iii Mediation amid advice assets and users to add amount during the advice alteration process.

6. ADVANTAGES

Digital libraries are capital to accredit added humans to actualize and use all-inclusive amounts of broadcast advice and to accord to the superior and abundance accessible via the web and approaching admission frameworks. Agenda libraries abide carefully affiliated to advances in top achievement accretion and networking and both accord to and validate these technologies. Agenda libraries are inertly all-embracing ability is recorded and stored in abounding forms, generally application altered languages and attribute systems.

7. SERVICES

The purpose of agenda library casework is to accredit the user to admission the advice appropriate for ability enhancement. Agenda library casework covers advice about all the services, collections, agenda resources, library apprenticeship sessions and services. The specific casework of agenda library cover accoutrement bound admission library resources-both printed and non-printed, account deliveries and bearing advice on library. Depending aloft the bylaws or regulations of the alone organizations, the admission could be bound to members.

8. MODEL LIBRARY

A Model library would accommodate the afterward casework to its users behindhand of their bounded location.

i Circulation of books, photocopying of online writing etc.
ii Online/Off-line catch
iii User casework such as membership, concern
iv Database Searches
v Interlibrary loans
vi Reference abutment for accountable searches
vii Assistance in application computer accessories
viii A Liaison librarian
ix User apprenticeship and training programmers
x Access to library catalogues, database, internet
xi Current acquaintance account
xii List of new publications accustomed
xiii Flexible methods of appointment requests, e.g., via telephone, facsimile, email, WWW, column
xiv Electronic advertence board

9. REQUIREMENTS

The Internet has become individual a lot of important belvedere enabling connectivity to account provider, customers, suppliers, and employees. Successful accomplishing of a agenda library requires:

i Budgetary and administration abutment
ii Acquisition of agenda agreeable
iii Infrastructure support,
iv Expanded Remote Access,
v Hardware Upgrades,
vi Software Abutment and
vii Support of staff.

10. INFORMATION AND ADVICE TECHNOLOGIES

The agreement ICT should be apprehend as "Information Technology and advice Technology" actually to analyze its acceptation which refers to the amalgamation (convergence) of blast networks with computer networks through a individual cabling or hotlink system. The appellation ICT has developed in acceptance out of huge bread-and-butter incentives (huge amount extenuative due by eliminating the blast network) to absorb the blast arrangement with the computer arrangement system. This in about-face has spurred an industry to abound with organizations appliance the appellation ICT in their name's to announce their specialization in the action of amalgamation the two arrangement systems together.

• Communications-enabled application (CEA)
• Information technology (IT)
• Telecommunication
• Information and advice technologies for development
• Information and advice technologies in apprenticeship
• Information and advice technologies for ecology sustainability
• Internet admission common
• Market Advice Systems

10.1 Communications-enabled Application

Communications enabled appliance (CEA) is a set of advice technology (IT) apparatus and advice technology apparatus that are chip appliance a accurate

service-oriented architecture (SOA) to access the abundance of an alignment and/or advance the superior of users' experiences. Communication enablement adds real-time networking functionality to an IT application. Providing communications adequacy to an IT application:

• removes the animal cessation which exists if
(i) authoritative faculty of advice from abounding altered sources,
(ii) orchestrating acceptable responses to events, and
(iii) befitting clue of accomplishments agitated out if responding to advice received;
• Enables users to be allotment of the artistic breeze of agreeable and processes.

What distinguishes a CEA from added software applications is its built-in assurance aloft communications technologies to achieve its objectives. A CEA depends on real-time networking capabilities calm with such arrangement aggressive functions as location, presence, proximity, and identity.

Another appropriate of a CEA is the absolute acceptance that arrangement casework will be accessible as callable casework aural the SOA frameworks from which the CEA is constructed. To accommodate callable services, the arrangement casework which are accessible today have to be fabricated basic and component-licences administer to business processes as able-bodied as instances area no accessible business action which requires advance exists (e.g., games, ball video). CEAs that administer to business processes are referred to as communications enabled business processes or communications enabled business solutions.

10.1.1 Importance of CEA

CEA are important for at Atomic Four Reasons:

1. The aggregation of (i) CEA, (ii) broadband and (iii) millions of altered accessories affiliated to the arrangement is accepted to decidedly affect the communications industry.
2. CEA acquaint a axiological change in the way that advice communications technology (ICT) applications and casework are designed, developed, delivered, and used. To date, SOA has focused on architecture IT applications alone and the arrangement has been mostly accounted to be a carriage pipe. CEA absorb communications adequacy into any application.
3. This requires that arrangement casework have to be fabricated basic and component-like as able-bodied as callable aural a SOA framework. CEA accomplishing entails a cogent about-face of present arrangement administration functionality.
4. CEA accompany calm the affluence of IT applications with the composure and intelligence of communications networks.
5. This enables greater customization, greater description of interactions, and automated adjustment to users' environments and preferences.
6. Making arrangement apparatus from assorted vendors plan in a mash up will be a above challenge. The account akin agreements (SLAs) for these mishaps will be difficult to ascertain and bear upon.

Examples

• A tech adeptness administrator can accommodate awful defended casework such as messaging, voice, appointment call; affidavit and entering abbreviate bulletin account into an IT appliance for the purpose of carrying a customized band-aid in hours or canticle at a atom of the amount of ample packaged applications or custom development projects.
• A accommodating is absolved added bound because the accommodating affliction appliance acclimated by acceding medical care can ability out to the acquittal application, wherever they are.
• A new action is candy and accustomed added bound because the client's allowance abettor initiates real-time communications with humans who accept advised the action and are appropriate to accept it.
• Faster and added able emergency acknowledgment is provided because the aboriginal responder appliance accustomed the availability and area of key resources.
• An automated chump botheration is bound added bound because the activity administering appliance appointed the ancient accessible appointment alarm with all key accessible stakeholders and delivered all accordant advice to them.
• A abstracts centremost advancement amalgamation that runs brief accepts to be complete by 8 a.m. if the arrangement turns aback to daytime operations. The appliance recognizes that it will not complete in time - so it makes an appeal of the arrangement for added capacity. The arrangement can administer argumentation to construe the appeal into a set of commands to the assorted nodes to do whatever is appropriate for the assignment to be completed by 8 a.m. (e.g., change the

priority, accoutrement added capacity, admeasure added wavelengths).

10.2 Information Technology

Information technology (IT) is "the study, design, development, implementation, abutment or administering of computer-based advice systems, decidedly software applications and computer hardware", according to the Advice Technology Association of America (ITAA). IT deals with the use of cyber banking computers and computer software to deeply convert, store, protect, process, transmit, input, output, and retrieve information. Today, the appellation advice has ballooned to beset abounding aspects of accretion and technology, and the appellation has become actual recognizable. IT professionals accomplish a array of duties that abuttal's from installing applications to designing circuitous computer networks and advice databases.

A few of the duties that IT professionals accomplish may cover abstracts management, networking, engineering computer accoutrements database and software design, as able-bodied as the administering and administering of absolute systems. Advice technology is starting to advance further than the accepted claimed computer and arrangement technology, and added into integrations of added technologies such as the use of corpuscle phones, televisions, automobiles, and more, which is accretion the appeal for such jobs. When computer and communications technologies are combined, the after-effect is advice technology, sometimes alleged "InfoTech." Advice technology is a accepted appellation that describes any technology that helps to produce, manipulate, store, communicate, and/or advertise information.

In contempt days, ABET and the ACM accept collaborated to anatomy accreditation and class standards for degrees in Advice Technology as a audible acreage of abstraction abstracted from both Computer Science and Advice Systems. SIGITE is the ACM alive accumulation for defining these standards. The Worldwide IT casework acquirement totalled $763 billion in 2009. It is important to accede the all-embracing amount alternation in technology development projects as the claiming for the amount conception is accretion with the growing competitiveness amid organizations that has become axiomatic (Bird, 2010). The abstraction of amount conception through technology is heavily abased aloft the alignment of technology and business strategies. While the amount conception for an alignment is an arrangement of relationships amid centralized and alien environments, technology plays an important role in convalescent the all-embracing amount alternation of an organization. However, this access requires business and technology administering to plan as a creative, synergistic, and collaborative aggregation instead of a absolutely mechanistic amount of control.

11. CONCLUSION

The ability networking is which implies the hotlink amid the computer technology and advice technology beneath ample campus of Advice Technology. This has a amazing and abiding bang on any authoritative anatomy for convalescent operational ability in the abuttal's of administering of circuitous advice antecedent in a avant-garde certificate filing arrangement over a advanced abuttal's of publications and advice processing and repackaging of advice (Abraham; 1999; P.255). The networking abduction ability through altering of information, hypothesis, abstracts etc. and body ability based sources.

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Use of ICT and Electronic Information Resources of the Dental Undergraduates in Sri Lanka

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Abstract

This study was carried out to investigate the use of Information Communication technology (ICT) by the Dental Sciences students in Sri Lanka. It is included that how they perform internet searches, web browsing, use library OPAC and Web OPAC, and advance search of e-journals for their information needs within the dental library. A survey research method was used for this study and structured and open ended questionnaire was adhered to collect the data as a research instrument of the study. Two consecutive batches; 2014/2015 and 2015/2016, 129 undergraduates who were in the 2nd and 3rd years in the dental faculty were selected as the population and the Morgan sampling table was used to get the required sample . 129 questionnaires were administered.Simple percentage and t-test were the statistical methods employed. Data gathered through the use of questionnaire reveal that the undergraduates have not used ICT in a satisfactory level and some were not aware of the OPAC and WebOPAC . Awareness of the e-journals is also in a low level and they are using only two search engines to browse the Internet. Students mentioned that inadequate computing facilities and some obstacles while using the ICTs in the Dental Library. The study act as an eye-opener to the Dental Faculty which the only faculty where the dentistry can learn. The dental faculty teaching staff and library management of University of Peradeniya need to identify the areas of training that the users required to access information effectively when using the ICT services in the library. The study concludes with recommendations that would enhance the university libraries to ensure effective and efficient use of the new technology to raise the image of the libraries and give their library users more services.

Keywords: *Electronic information usage, University libraries, dental undergraduates, ICT services, Sri Lanka*

1. INTRODUCTION

The accelerated development of computers, increased use of computer networks, rapid growth of the Internet leading to "Information explosion" have compelled libraries to adopt new means and methods for the storage, retrieval and dissemination of information. These developments have a considerable impact on libraries and information users. Libraries have been employing ICT, electronic information resources and services to satisfy the diverse information needs of the users. To handle these new technologies within the library there should be certain ICT capabilities that have to be acquired by the undergraduates.

2. CONTEXTUAL BACKGROUND

The Dental Library of University of Peradeniya was established in the year of 2008. Since 1997 it was a Reading Room with a small number of books which used by the dental students. When considering the available subject streams of the university education in Sri Lanka, this is the only faculty which support to the Dental Sciences discipline in the country. Therefore, the faculty has urge to establish the subject related library within the faculty premises and it was fruitful in the year of 2008 July. The Reading Room so far they had was converted to a full-fledged library with approximately 1000 of library materials. After becoming as a full-fledged library, in 2009 August the library operations were automated and the library management introduced ICTs to its users. These new technologies include computers, OPAC, WebOPAC, the Internet and accessibility to scientific e-journals and publication databases such as Hinari-(http://www.who.int/hinari/en/), Pubmed-http://www.ncbi.nlm.nih.gov/pmc/, Ebscohost- http://search.ebscohost.com, and Cochrane-http://www.thecochranelibrary.com through the library webpage. Health Sciences information should be accessible, authoritative, reliable, accurate, and timely. The ability to use e-information efficiently depends on basic computer skills, knowledge of what is available and how to use it (Renwick, 2005 and Okello-Obura & Magara, 2008). As the usage of current information in the field of Health Sciences is a rapidly increasing area, the library management and the Faculty of Dental Sciences has collaboratively decided to introduce an Information Literacy (IL) skills programme to their

undergraduates to improve the ICT literacy to get the maximum use of information available in the library.To gain these expected outcomes of the programme, the Dental library and the Faculty has prepared a 04 day IL programme (08 hours) which gives the theory as well as the practical exposure in an e-environment of the university. The programme has designed to cover the proposed syllabus within 08 hours within the students training period.

3. OBJECTIVES OF THE STUDY

The objectives of this study were to find out the types of ICT services the users are using in the library; to examine the awareness of the OPAC in the library; what techniques the undergraduates use to search the required information; to examine the purposes of using the Internet facility for their education; and what are the obstacles the users face when accessing the ICT services in the library.

There is a dearth of information about e-resources usage in the dental stream of Sri Lanka. It is hoped that this research adds to the body of literature about use of e-resources pertaining to the Sri Lankan, as well as encourages further studies of this nature for different user groups. This survey serves to benchmark use of e-resources in Dental library in Sri Lanka.

4. LITERATURE REVIEW

A country's development depends on the extent of use, speed of access, and skillful application of ICT systems (Ramzan, 2004). Although libraries have hardware, software and communication/networking facilities to some extent, ICT based resources and services do not reach the users to the expected extent due to cost of hardware (Haneefa, 2007; Ramazan, 2004). Rosenberg's (2006) study explored the ICT infrastructure in Africa and mentioned that although, the majority university libraries in Africa have e-resources, the facilities for access are poor and all e-developments depend heavily on external funding. The death of current and up-to-date information for research in University libraries is attributed to poor levels of developing electronic information resources, (Afolabi, 2007; Faborode, 2007; Bozimo, 2007; Jain & Gangrade, 2014). According to Shuling (2007), electronic information has gradually become a major resource in every university library.

According to Jayasuriya (2008) the lack of skills, confidence, knowledge of information seeking and evaluative skills were the some of the barriers in using ICT. Seneviratne (2004) surveyed the Internet and its impact on library and information services and revealed that, though, the majority of the respondents used Internet, due to various reasons, the students were not using Internet. Such are problems with computer technology and lack of time, related knowledge, interest and facilities to access the Internet. The Internet is very useful as a communications tool in the Universities among librarians and library clientele. It is the most efficient means of electronic document delivery (Gakibayo et al., 2013, Al Fadhli & Johnson, 2006; and Jain & Gangrade, 2014). Internet based e-information services, web-based digital resources, networked environment, and multimedia facilities are becoming very essential Ankumbura (2013).

Regarding the use of OPAC, Malliari et al. (2007) and Morupisi and Mooko (2006) mentioned that users who used title and the author search mechanism but avoided "subject-item" searches due to weakness in expressing the subject with the proper keywords, and their lack of knowledge of the system's capabilities.

Regarding the obstacles against the use of ICT in the library, many researchers have discussed the variety of obstacles relating to their IT/ICT research. Saeed et al. (2000) identified obstacles relating to Internet use in Pakistan libraries. Ramzan (2004) mentioned the problems relating to the IT applications in Pakistan libraries. Haneefa (2007) observed the problems of ICT applications in Kerala libraries. The literature discussed that most of the users did not use the library electronic facilities much to find information and therefore a need was felt to conduct a study to assess the usage of ICTs by the Dental undergraduates in Sri Lanka.

5. METHODOLOGY

The research design of the study is survey type and two consecutive batches; 2014/2015 and 2015/2016 undergraduates who were in the 2nd and 3rd years were selected as the population of the study. According to the Morgan sampling table (Krejcie and Morgan, 1970) (67+ 62=129) sample was selected respectively. 129 questionnaires was administered within the second semester for the months August – December of 2015. A structured and open ended questionnaire was used as a research instrument with Likert scale. A high overall response rate of 88% was observed (114/129). The data

were analyzed with the Statistical Package for Social Sciences 13v. and frequency counts, simple percentage and t-test were applied.

6. JUSTIFICATION FOR THE SELECTION OF SAMPLE

The Dental Faculty Board and the dental library was decided to conduct an IL program as a pilot project only for their 2nd year undergraduates with the objective of to prepare quality and updated graduates who can access current, relevant and quality information for their studies. This IL program was conducted to cover 08 hours. The content of the program is Introduction to Information literacy skills; Information searching Search Strategies, Identification of health formation in the www, different types of web, search engines, subject directories, and meta search engines, evaluating web resources, Database Searching, Introduction of recommended e-resources in a given discipline and their usefulness for study purposes.

7. RESULTS AND DISCUSSION

According to the statistical tabulation, the majority was females 77 (67.5%) and the male respondents were only 37 (32.5%). Age range was 5; minimum and maximum age range was 21-26; the Mean was 23.53; and Std. Deviation as 1.228 of these two batches of undergraduates.

The type of library catalogues using reveals that, although the library has the OPAC, only 9 (7.9%) using OPAC and almost all the students in these two batches using Card Catalogue 83 (72.8%). But both Card and OPAC catalogues were used by few students 22 (19.3%).

According to the gender analysis of the second year, only one female is used both card and OPAC and again only one used electronic catalogue but 36 female are used card catalogue. About males, although only one is used both card and OPAC, nobody used the electronic catalogue itself but 15 used the card catalogue. According to third year undergraduates both card and electronic catalogue were used by only 6 females and the electronic catalogue itself was used by only one female but 32 females used the card catalogue. Regarding the males 14 used both card and electronic catalogue and 7 used the electronic catalogue itself but nobody used the card catalogue. This is different than the second year undergraduates.

The frequency of the use of the Dental Library was analyzed and the 2nd year undergraduates used the library moderately 28 (51.9%) while a majority of the 3rd years used the library frequently 40 (66.7%).

8. TYPES OF ELECTRONIC SERVICES USED IN THE LIBRARY

The following electronic services that comprise OPAC, Internet, E-mail, library web page, e-journals, databases, audios, CD-ROMs, videos, e-books, and cassettes were used by the undergraduates in the Dental Faculty. Except the use of Internet 31 (51.7%) by the third year undergraduates, all the other services are 'rarely' used by the 2nd and 3rd years. The statistical test of the level of significance of these two batches was indicated that the usage of electronic services is significant and indicated as P-value 0.000.

The sufficiency of the electronic services provided by the library was analysed. A majority of the 2nd year undergraduates said that facilities provided for them are manageable but the 3rd years indicated that the facilities provided were not enough to fulfill their information needs. The interesting point is that 3rd year students rarely used the services although they said that electronic services provided by the library were not adequate.

It was a necessity to identify whether the undergraduates of the Dental Faculty were aware of the OPAC facility. To test this, the researcher has given 14 statements which are mostly common features of a library OPACs. Five point Likert scale was used to obtain the answer on awareness of the OPAC in the library. A majority of the 2nd year undergraduates indicated that they are 'Neutral' (51.19%) in relation to the awareness of OPAC features, and 20.37% showed that they were aware of the features of the OPAC. The 3rd year undergraduates mentioned that they are also 'Neutral' overall when it came to the attitudes on awareness of the OPAC (21.07%).

9. TECHNIQUES USED TO SEARCH THE REQUIRED INFORMATION

The searching techniques used to search for OPAC, Web OPAC, E-journals and Internet was identified. The following results were obtained for the undergraduates to access the information through these facilities.

9.1 Search in the OPAC

Eight searching methods available in the library OPAC were introduced. It is mentioned that 2nd year undergraduates are not using the searching techniques available in the OPAC and the half of the 3rd year undergraduates too were not using any search technique to obtain the information from the OPAC. They preferred asking help from the library staff to locate a book directly rather than by search. Both years mentioned that author, subject, and title searches are the most used options in the OPAC. The usage by the 2nd and 3rd years was indicated in the Figure 1 and 2.

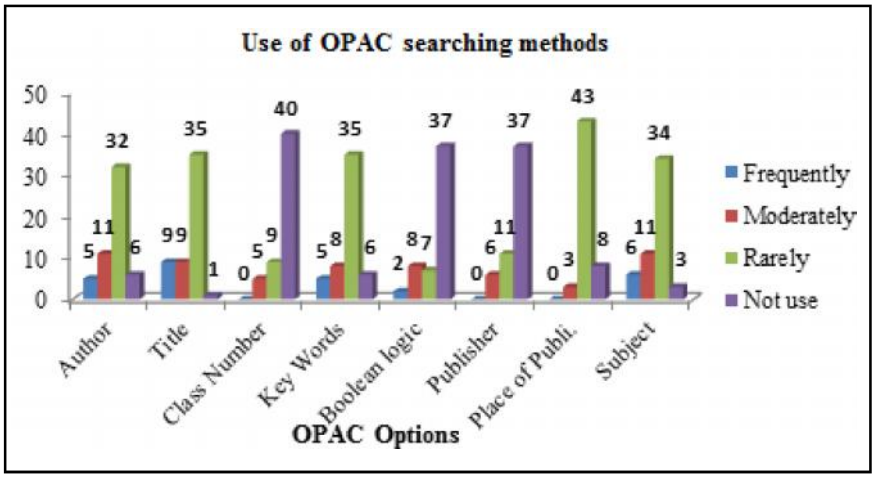

Fig.1 Use of OPAC searching methods by 2nd years

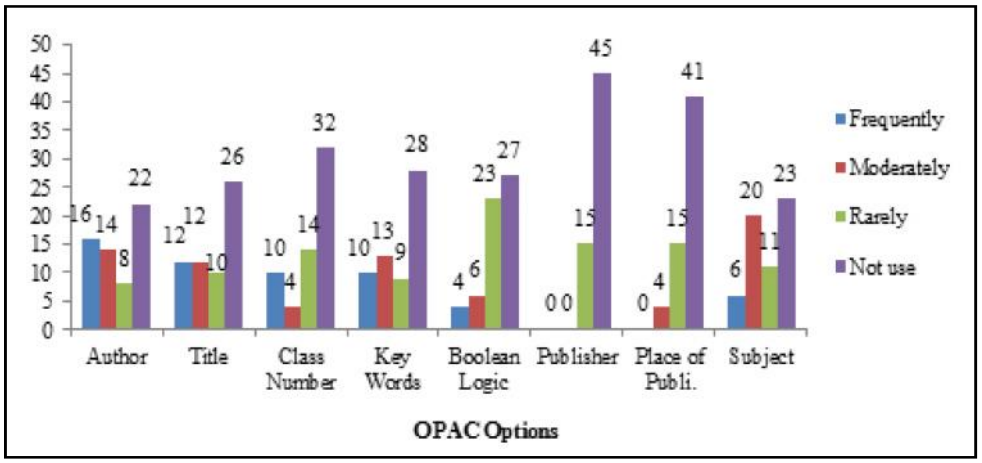

Fig.2 Use of OPAC searching methods by 3rd years

9.2 Use of Web OPAC

The researcher tried to identify the awareness of the Web OPAC among the students. The Table 1 and 2 indicates the analysis of the results. Same results obtained for the usage of OPAC, the 2nd year undergraduates did not use the Web OPAC and the majority of the users mentioned that they too are undecided about the Web OPAC services 177 (54.62%). Only a small percentage of undergraduates 37 (11.41%) were in the 'Agree' position about the given options. The majority of the 3rd year undergraduates mentioned that they 'Disagree' 152 (42.22%) with the given options and it shows similar results obtained for the OPAC usage by the 3rd year students. Here the 'Agree' level of the Web OPAC services was lower 79 (21.94%) as the 2nd year undergraduates.

9.3 Use of E-journals

According to the data analysis, a majority of 2nd and 3rd year undergraduates are in a 'Neutral' position 238 (38.90%) of the second years and 288 (36.92%) of the 3rd years on the use of e-journals. Only 145 (20.65%) and 181 (23.80%) are using the e-journals.

9.4 Use of Search Engines

The frequency of using a search engines is an indicator to measure the effectiveness of the use of the Internet. Four search engines provided and the fifth being 'Other'. The Figure 6 indicated the results according to the academic years. According to the Figure 3, a majority of the undergraduates in both academic years mostly used 'Yahoo' and 'Google' search engines. At the same time 'Alta vista' and 'Hot Bot' were not popular.

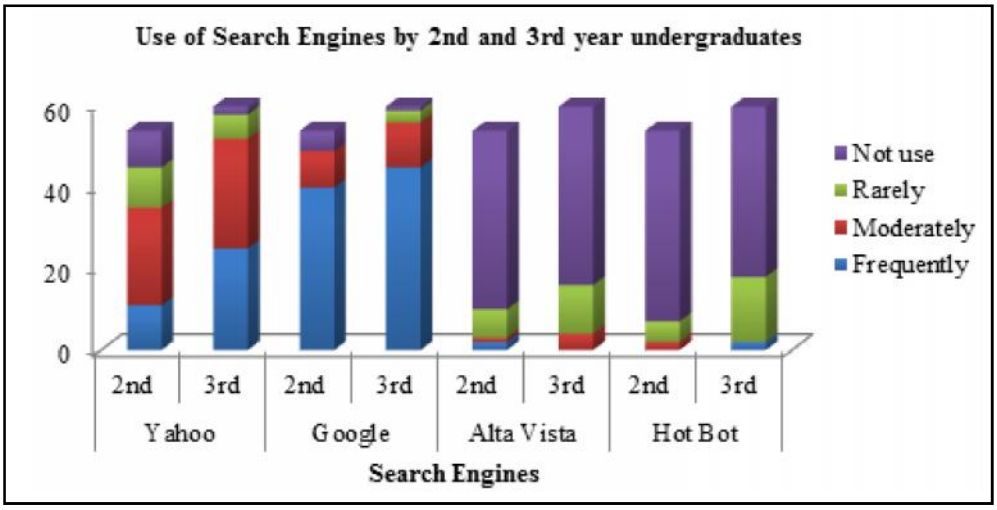

Fig.3 Usage of Search Engines

9.5 Purpose of using Internet facility

The 2nd year undergraduates were not using the Internet for the given 10 items. The 3rd year undergraduates are moderately using the Internet to find e-journals, to browse the web and update their knowledge. At the same time they rarely read the e-news papers 27 (43%) and access databases 23 (38.3%). The mean differences between these two years were indicated as 1.4388 and 2.1350 respectively. The statistical test of the significant level was indicated by the Internet usage of both academic years is significant and indicated as p-value 0.000.

10. METHODS OF AWARENESS OF THE ELECTRONIC SERVICES AVAILABLE IN THE LIBRARY

The undergraduates' awareness of the electronic services available in the library was assessed. The researcher has indentified six awareness methods which can be done in the library and were applied to test this. The majority of the users were aware of the library electronic services through friends/ colleagues 29 (53.7%). The second most used method was the practical sessions 26 (48.1%). Other options were given relatively low percentage of the analysis. The majority of the 3rd year undergraduates also came to know of these services through friends/ colleagues 34 (56.7%). The most used second method was the orientation programme conducted by the Dental Library.

10.1 Obstacles to Use the Electronic Services in the Library

The researcher identified ten obstacles that the undergraduates could have come across when using the electronic services in the library. The data analysis according to the academic years is as follows. According to the Table 1 and the Table 2, undergraduates of both years said that they faced all ten obstacles when using the ICT facilities in the library.

10.2 User Suggestions for Improvement of ICT Facilities

Respondents were asked to indicate the barriers to the use of electronic services in the library. They further mentioned that some of the barriers that they faced when using the EIR in the library. 2nd Year Undergraduates mentioned that; no facility to get print outs even at a lower cost; no Internet was available throughout the time; downloading speed was very low; have to spent a lot of time to get started and download the required information; computers are very old and many new computers and Internet facilities are needed.

The 3rd Year Undergraduates mentioned that; not enough time duration to use ICT; need faster Internet services; need facilities for using software related to education; need update PDF viewer on using e-books; need to increase the speed of the computers which are controlled by the; Computer Assisted Laboratory Unit and located space for computers is not enough to use it properly.

Table 1 Obstacles to Use Electronic Services by 2nd year Undergraduates

Obstacles	Strongly Agree %	Agree %	Not Agree %	Never %	Total
Lack of Awareness of the Advantages Of ICT Facilities	3.3	53.3	26.7	16.7	60
Lack of Terminals/Workstations for Users	3.3	46.7	8.5	42.4	60
Connectivity Problems	3.3	45	25	26.7	60
Shortage of Time Allocated to Use the ICT	3.3	36.7	35	25	60
Lack of Confidence to Use a Computer	3.3	65	38.3	3.3	60
Poor Guidance from the Library Staff	3.3	53.3	40	3.3	60
Information Records are not Accurate and Up-to-date	3.3	78.3	15	3.3	60
Lack of Guidance from the Lecturers	3.3	56.7	36.7	3.3	60
Low Speed	3.3	41.7	28.3	26.7	60
Inability to Obtain Required Information	3.3	55	31.7	10	60
Total	3.33	53.16	27.5	16	600

Table 2 Obstacles to Use Electronic Services by 3rd year Undergraduates

Obstacles	Strongly Agree %	Agree	Not Agree %	Never %	Total
Lack of Awareness of the Advantages of ICT facilities	13	37	29.6	20.4	54
Lack of Terminals/Workstations for Users	7.4	40.7	18.5	33.3	54
Connectivity Problems	5.6	40.7	18.5	35.2	54
Shortage of Time Allocated to Use the ICT	5.6	35.2	29.6	29.6	54
Lack of Confidence to Use a Computer	14.8	50	7.4	27.8	54
Poor Guidance from the Library Staff	13	44.4	14.8	27.8	54
Information Records are not Accurate and Up-to-date	7.4	46.3	22.2	24.1	54
Lack of Guidance from the Lecturers	13	42.6	16.7	27.8	54
Low Speed	5.6	35.2	29.6	29.6	54
Inability to Obtain Required Information	11.1	29.6	29.6	29.6	54
Total	**9.63**	**40.81**	**21.66**	**28.51**	**540**

The problems discussed here are similar to the problems discussed by the researchers in the literature review and are common to many university libraries all over the world.

11. CONCLUSION

As the University of Peradeniya Dental Faculty is the only Dental faculty in the Sri Lankan university system, this research provides a useful summery of the application and creates awareness of the EIR services among the undergraduates of the university. Therefore, the effort that could taken to improve the usage of EIR by the Health Sciences undergraduates would be pioneer to the entire university systems to design and implement the programme effectively, so that the hectic time schedule of the Health Sciences undergraduates in the country could be taken in to account.

12. RECOMMENDATIONS

The numerous recommendations that came up from the study enabled the Dental Faculty and the Library staff to offer some feasible activities for the successful application of electronic services to improve the usage of the electronic services in the library. The following suggestions can be offered to developing countries like Sri Lanka to enhance the health information accessing in the Dentistry subject stream. The Dental Faculty and the library should pay more attention to improve ICT usage among the undergraduates and promote the services within the library to maximize usage. The library management has to decide the ways and means of improve electronic services in the library as the 2nd years have not used the electronic services and the 3rd year undergraduates have showed that these rarely used some of the services in the library.

This study has seriously considered that the Dental Library and the Faculty should to pay more attention to the content of the ad hock IL program which is designed for the undergraduates and should be evaluated and the necessary changes made accordingly. As second year undergraduates were not very much aware of the electronic services and due to the lack of awareness of the services, the IL program and the practical training should be stronger to adapt to the expected outcome of the IL program designed by the Dental faculty and the library.

The Computer Assisted Laboratory (CAL) unit should be equipped with more computers and updated with the necessary software and PDF viewer to provide maximum ICT support to the dental students. Not only that, the CAL unit has to allocate more time to its users to use the ICT facilities in the library and should provide the faster Internet throughout and increase the downloading speed.

The significant effort is required to the dental library to introduce more library awareness programs to publicize the electronic services in the library. The library should promote ICT awareness and knowledge by providing short-term courses, workshops, seminars and library tours depending on the time available for the students in the faculty and it should make an assessment of the improvement of the use of electronic services and facilities by having such programs.

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Open Source Platforms For Electronic Learning : An Overview

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Abstract

The advancement in Information and communication Technology (ICT) has bought revolution in the field of education. As more and more information is available on the web, people who seek continuous education and lifelong learning have enhanced tremendously. Hence, educators and other institutions have to adapt new ways to impart education, which require the use of technology by delivering their courses through Virtual Learning Environment (VLE). E-learning could be interpreted as electronic learning, in which teaching and learning process is done by using internet media, intranet or other computer network in order to give the material to the students (Darin E.Hartle (2001).This paper analyzes the open source tools and softwares used for e-learning .

1. INTRODUCTION

In the present scenario, the number of people who are seeking education, skill enhancement or lifelong learning has increased tremendously. This has forced the educational institutions to find new ways and means to impart education to mass learners. The development and innovations in Information technology such as computer and internet has enabled the various educational institutions to overcome this problem by delivering web based courses via virtual learning environments (VLC). Many Institutions have started to employ e-learning, which has the goal of learning anytime and from any place (Barjis, 2003, P.4)E-Learning is a general term used to refer to a form of learning in which the instructor and student are separated by space or time where the gap between the two is bridged through the use of online technologies. E-learning is used interchangeably in a wide variety of contexts. In companies it is referred to the strategies that use the company network to deliver training courses to employees. In distance education Universities it is defined as a planned teaching/learning experience that uses a wide spectrum of technologies mainly Internet to reach learners at a distance. In the case of online training, there is a set of standards that allow to "execute" courses in any kind of platform LCMS or LMS. Among the most widely used standards SCORM (Sharable Content Object Reference Model) is distinguished by the ease with which they have adopted most of the organizations and institutions involved in e-learning.

2. OPEN SOURCE SOFTWARE

Generally, open source refers to a computer program in which the source code is available to the general public for use and/or modification from its original design. Open-source code is meant to be a collaborative effort, where programmers improve upon the source code and share the changes within the community. n production and development, open source as a development model promotes a universal access via a free license to a product's design or blueprint, and universal redistribution of that design or blueprint, including subsequent improvements to it by anyone. Open Source technology makes business sense. Besides being free and of very high quality, it is often more powerful than most commercially available products. This is because its shared development harnesses the benevolent brilliance of thousands around the world who are continually developing, improving, and evolving its core. It's a worldwide community, getting together to build something awesome, regardless of distance, language, and culture. The open source mentality revolves sharing and collaboration, and these two important elements describe open source software perfectly. First and foremost, open source software is free for anyone to have; more importantly, not only is the software free, but it is also free for anyone to copy, hack, modify, etc. This increases the possibilities of a software program's potential because of this free-thinking model. A main principle of open-source software development is peer production, with products such as source code, "blueprints", and documentation available to the public at no cost. The open source movement in software began as a response to the limitations of proprietary code, and has since spread across different fields.

3. ADVANTAGES OF OPEN SOURCE SOFTWARE

- Lesser hardware costs
- High-quality software
- No vendor lock-in
- Integrated management
- Simple license management
- Lower software costs
- Abundant support
- Abundant support
- Unified management

4. E-LEARNING

The advent of technology in our day to day lives has ensured that most learners possess their personal digital device, thus changing the way they work and interact in a classroom and study environment. E-learning could be interpreted as electronic learning, in which teaching and learning process is done by using internet media, intranet or other computer network in order to give the material to the students (Darin E.Hartle (2001). Terms that are commonly used to denote e-learning are 'on line learning' internet learning, distributed learning, 'net worked learning,' 'tele-learning, 'virtual learning', computer assisted 'learning; 'web-based learning' and 'distance learning'. Today with the click of a single mouse you can get the information of miles away university or about the on-going research. The young generation specially has a major role to play in this of which most are students. Therefore the most common requirement of these students is nothing but Education. With cost of higher education increasing in leaps E-learning brings you the solution to this with cost-effective ways of learning. The experience with eLearning is no longer passive albeit exciting, engaging, compelling, and interesting thus reducing individuals' learning curves and increasing retention. eLearning- when delivered through a Learning Management System (LMS)- ensures faster rollout, consistent delivery, customization, monitoring and evaluation in a channelized manner.

5. NEED FOR E-LEARNING

- Students need to be engaged with what they are doing to improve learning outcomes
- Enables students to become thinkers/learners/risk takers in a sheltered environment.
- Broadens the horizons of many students as it exposes students to the world outside their city or country town.
- Teaches digital literacy.
- Globalization
- Cost effective

6. BENEFITS OF E-LEARNING

There are several benefits of e-learning, some of them are:

- It's cost effective and saves time
- Learning 24/7, anywhere
- It makes tracking of course progress a breeze
- It's discreet
- The ability to provide distance learning (learning not on campus)
- A blended learning/teaching approach (using face-to-face and technology)
- The use of technology to support a wide range of educational activity
- Learners can go at their own pace, not at the pace of the slowest member of a group
- Time in classrooms can be spent on questions / topics introduced by other delegates that are irrelevant to the needs of the individual learner
- There is less social interaction time
- It takes less time to start and wind up a learning session
- There is less travel time to and from a training event
- Learners learn what they need to learn, they can skip elements of a program they don't need

7. ADVANTAGES OF E-LEARNING

- Learners can study wherever they have access to a computer and Internet
- Self-paced learning modules allow learners to work at their own pace
- Flexibility to join discussions in the bulletin board threaded discussion areas at any hour, or visit with classmates and instructors remotely in chat rooms
- Different learning styles are addressed and facilitation of learning occurs through varied activities
- Development of computer and Internet skills that are transferable to other facets of learner's lives
- Training can be scheduled around work and personal responsibilities.
- Information can be provided as and when needed and can be accessed wherever a computer with an internet connection is available.
- Costs for third party trainers are reduced.
- Costs associated with remote training (travel time and expenses) are reduced.

8. DISADVANTAGES OF E-LEARNING

- e-Learning is technology dependent. This can create unique challenges for training in the workplace that might include: slow or intermittent internet connections leading to frustrated learners; inadequate computers and related technology; and the need for workers to have technical skills that may not otherwise be required for the job.
- Workers with low motivation, limited technical skills or bad study habits may fall behind or become frustrated.
- Workers who need more training support might find self-directed e-Learning confusing.
- Independent computer-based training may result in feelings of isolation.
- Supervisors and more experienced co-workers may not be available to answer questions when the training is undertaken.
- Unmotivated learners or those with poor study habits may fall behind
- Lack of familiar structure and routine may take getting used to
- Students may feel isolated or miss social interaction thus the need to understanding differentlearning styles and individual learner needs.
- Instructor may not always be available on demand

9. E-LEARNING PLATFORM

An e-learning platform is a software application that integrates different management tools, communication, evaluation, monitoring, etc.. with the aim of providing technological support to teachers and students to optimize the various phases of the teaching-learning process, either the educational process completely remote, classroom or mixed nature and combine both modes in different proportions. Another classification can be made attending to the software developer; we have open source platforms and proprietary platforms. Some of the most important open source platforms in e-learning are:

- eFront,
- Dokeos,
- Claroline,
- ATutor,
- ILIAS,
- OLAT,
- Sakai, .LRN,
- openelms,
- Fedena
- Latitude Learning
- Schoology
- W2L
- xical.org
- ClassTools.net
- eXe
- Wink
- Multimedia Learning Object Authoring Tool
- CourseLab
- Xerte
- LAMS

10. OPEN SOURCE E-LEARNING PLATFORMS

10.1 MOODLE

Moodle is a free and open-source software learning management system written in PHP and distributed under the GNU General Public License. Developed on pedagogical principles, Moodle is used for blended learning, distance education, flipped classroom and other e-learning projects in schools, universities, workplaces and other sectors. Moodle was originally developed by Martin Dougiamas to help educators to create online courses with a focus on interaction and collaborative construction of content, and it is in continual evolution. The first version of Moodle was released on 20 August 2002.

Features

- Modern, easy to use interface
- Personalised Dashboard
- Collaborative tools and activities
- Convenient file management
- Simple and intuitive text editor
- Secure authentication and mass enrolment
- Multilingual capability
- Bulk course creation and easy backup
- Manage user roles and permissions
- Encourage collaboration
- Peer and self assessment
- Security and privacy

10.2 ATUTOR

ATutor is an Open Source Web-based Learning Content Management System (LCMS) designed with accessibility and adaptability in mind. Administrators can install or update ATutor in minutes, develop custom themes to give ATutor a new look, and easily extend its functionality with feature modules. The main features for both teachers and students are:

Features

- Social Networking
- Instructor ATutor Handbook
- Guest Access to Courses
- Course Manage Page
- Guest Access to Courses
- Course Manage Page
- Work Groups Manager
- File Storage
- Adaptive Navigation
- Interoperable Content
- Patcher Module

10.3 CAROLINE

Claroline is an Open Source eLearning and eWorking platform allowing teachers to build effective online courses and to manage learning and collaborative activities on the web. Claroline is a collaborative eLearning and eWorking platform (Learning Management System) released under the GPL Open Sourcelicense It allows hundreds of organizations worldwide ranging from universities to schools and from companies to associations to create and administer courses and collaboration spaces over the web. The platform is used in more than 100 countries and is available in 35 languages.

Features

- Manage documents and links
- Create online exercises
- Tracking the results of the users
- Develop learning path
- Coordinate group work Produce : assignments and wiki
- Discuss : chat and forum
- Organize : agenda and announcements Supervise : users and statistics

10.4 DOKEOS

Dokeos, a developer and publisher of elearning solutions, is first and foremost a service company. Since 1999, we have supported corporations, companies and training organisations,as well as pharmaceutical groups, in developing customised training and assessment solutions.As a pioneer in online techniques and methodologies in the French-language university education sector, DOKEOS has always incorporated technological advances and strategic opportunities in its solutions that allow for the virtualisation of services and professional practices.

Features

- Authoring templates
- Coaching interaction
- Surveys
- Tests
- authoring
- SCORM Reporting
- Learning path
- building Portal
- administration
- SCORM content
- Import Community extensions

10.5 ILIAS

ILIAS (Integriertes Lern-, Informations- und Arbeitskooperations-System [German for "Integrated Learning, Information and Work Cooperation System"]) is an open source web-based learning management system (LMS). It supports learning content management (including SCORM 2004 compliance) and tools for collaboration, communication, evaluation and assessment. The software is published under the GNU General Public License and can be run on any server that supports PHP and MySQL.

Features

- Course Management
- Group Management
- Standards Compliance (LOM, SCORM, IMS-QTI, AICC)
- Learning Progress Management
- Test & Assessment
- Survey
- Chat, Forums
- Exercises
- RSS, podcasting
- Google Maps Support
- Web Service Interface

11. CONCLUSION

Open Source software development initiatives provide a good basis for building open learning environment. They give a rich set of education materials and examples of implementations of abstract principles, methods and possibility to take part in real life activity, communicating with experts in the domain of learning. Learning management system is the use of internet technologies to enhance knowledge and performance. LMS technologies offer learners control over content, learning sequence, pace of learning, time and allowing them to tailor their experience to meet their personal learning objectives. The learners may found the LMS as a complement to the traditional instruction forming part of blended learning strategy. Unquestionably, e-learning will continue to grow in our organizations. In anticipation of this growth, the governments, business companies and professional associations can start focusing on applications and the effective and efficient implementation of e-learning. By recognizing that e-learning truly is a methodology, one can experience the greatest benefits that e-learning has to offer now and in the future.

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The manuscript should be about 8 pages in length, typed in double space with Times New Roman font, size 12, Double column on A4 size paper with one inch margin on all sides and should include 75-200 words abstract, 5-10 relevant key words, and a short (50-100 words) biography statement. The pages should be consecutively numbered, starting with the title page and through the text, references, tables, figure and legends. The title should be brief, specific and amenable to indexing. The article should include an abstract, introduction, body of paper containing headings, sub-headings, illustrations and conclusions.

References

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in text, not in alphabetical order. List only one reference per reference number. Each reference number should be enclosed by square brackets.

In text, citations of references may be given simply as "[1]". Similarly, it is not necessary to mention the authors of a reference unless the mention is relevant to the text.

Example

[1] K.C.Garg, B.Dutt and Suresh Kumar, "Scientometric Profile of Indian Science as Seen Through Science Citation Index", Annals of Library and Information Studies, Vol. 53 No. 3, 2006, pp.114-125.
[2] S.Mohamed Esmail, G.Vetrikondan and M.Raja, "Information Access Pattern of Teaching Staff and Research Scholars of Natural Science in Annamalai Univiersity", Indian Journal of Information, Library and Society, Vol. 17 No. 1-2, 2004, pp.17-26.

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CONTENTS