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## INFORMATION TECHNOLOGY (IT) USAGE & AWARENESS BY SCHOOL STUDENTS: A BIBLIOMETRIC STUDY

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**Abstract:**-This paper investigates the publishing trends of IT in School environment literature available in LISA database during 1985-2012. Our findings indicate that the amount of research in above field of study is increasingly enormous. Around 40 core journals of related concepts were analyzed. Also, this extensive study of literature revealed that there were many studies related to the different issues concerning use of information Technology by school student and this concept appeared in the literature since 1980s onwards. Literature published in related topic was scanned and more results are presented.

**Keywords:** Education Technology, Bibliometrics, Citation analysis, Information Technology.

### 1. INTRODUCTION

The contemporary generation has witnessed a tremendous drift in Information Technological society, which has invaded all spheres of our daily lives. The Information Technology deals with the use of computers and telecommunications to retrieve and store and transmit information<sup>1</sup>. Information is truly a requirement to every individual and hence technological literacy is very much vital. Increased access to Information Technology can reduce the cost of education and effectively meet the challenges faced in educating citizens. Certainly the advent of IT in education has brought various upbeat progresses and hope which includes anytime learning, collaborative learning, distance learning, enhanced communication and many more.

The new technologies challenge traditional conceptions of the teaching-learning process by reconfiguring how teachers and learners gain access to knowledge. It has immense potential to transform education processes. ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centered and text-bound classrooms into rich, student-focused, interactive knowledge environments.

Over the past 13 years, there has been an incredible increase in articles, books, conference proceedings, magazines and online literature all related to the Information Technology (IT). The paper is an attempt to make a bibliometric study of literature pertaining to extent of usage of Information Technology (IT) by school students.

### 2. LITERATURE REVIEW

Information Communication Technology's (ICT's) increasing substantial role in the modern world, to name a few are in the field of Commerce, Banking and the Media sectors. Cook and Finlayson (1999) noted that with the rapid advancement of technology in the modern world it is important to be acquainted with the use of ICT. From his perspective, access to ICT will determine who will be part of the world of technology in the future. The educational issue we need to address is: are we adequately preparing students for this world? This is especially important in the light of increased criticisms that suggest ICT in schools has not significantly contributed to pupils' scholastic improvement (Hokanson and Hooper, 2000).

However, there are two major views regarding the use of ICT in education and its implications for society,

which can be classified as the optimistic and pessimistic views (Howell and Lundall, 2000; Polikanov and Abramova, 2003; Selwyn, Gorard and Williams, 2001). The optimistic view embraces the use of ICT in education. Howell and Lundall (2000) mention two kinds of optimists – the in evitabilists and the euphoric or visionary optimists. The in evitabilists maintain that ICTs are a significant part of everyday life and that one should be acquainted with them. Furthermore, ICTs should be an important part of the school curriculum in order to prepare learners for the modern world of technology. The euphoric and visionary optimists, on the other hand, maintain that ICTs, which are increasingly found in the economy, may change the way we live, communicate and work (Howell and Lundall, 2000).

In contrast, the pessimists’ view is that ICTs epitomize the already huge digital divide that exists between the developed and the developing world (Howell and Lundall, 2000; Polikanov and Abramova, 2003; Cuban, 2001). Not only do they maintain a pessimistic view in terms of the digital divide, but also in terms of how ICT is taught in the classroom. Stoll warns that computers encourage students to hand in “hypermedia projects” instead of written assignments. He further cautions that simply downloading any material from the Internet does not mean that the student has learnt anything. From personal experience at my school when I gave the seventh grade classes a project to do, one of the students simply downloaded the information from the Internet without even reading the content, and handed me the copied pages.

Many governments seem to embrace the optimistic view, by encouraging the implementation of more and more computers into schools, believing that this medium will change pupils and society for the better (Mooij and Smeets, 2001). But, are computers skills enough to prepare students for the information age, and how important are computers in schools in the information age? is the question before us.

### 3.OBJECTIVES

This study documents the progress and contemporary state of research in the “Information Technology (IT) usage by school students’ literature using bibliometric analysis. Specifically, the objectives of the study include:

- To map the development of research in the “Information Technology (IT) usage by school students’ literature
- To identify the structure of this scientific community, pertaining to above literature

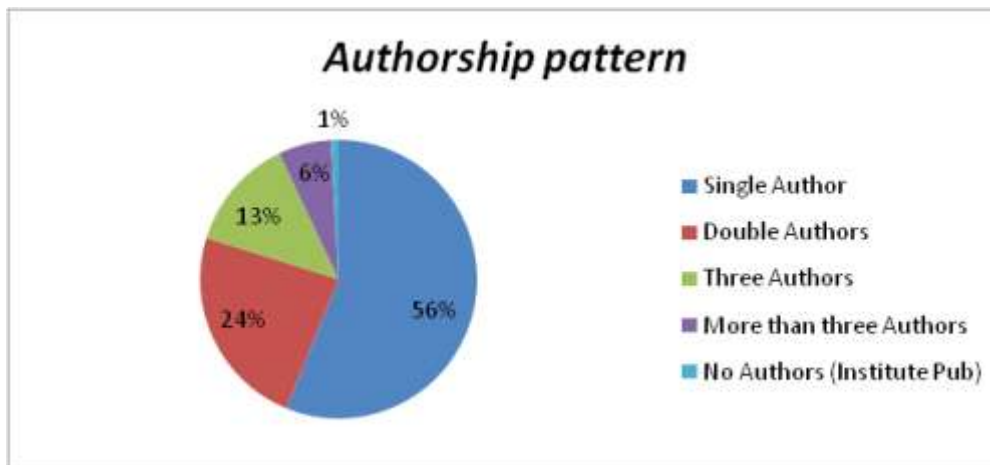
### 4.METHODOLOGY

A total number of 228 articles published in Education Technology related information resources during year 1985-2012 were analyzed with regard to year wise distribution, publications by publishers, total number of articles and the language of publication.

For the bibliometric analysis, each of the journal articles were categorized independently by titles, authors, year, journal name, language and other parameters. Various simple statistical methods were used to analyze the data and prepare the relevant charts or graphs. The results derived hence were mapped to identify useful information regarding the research progress in our field of study.

**Table-1**

| <i>Authorship pattern</i> |                 |      |
|---------------------------|-----------------|------|
| Authorship                | NO, of Articles | %    |
| Single Author             | 128             | 56.1 |
| Double Authors            | 54              | 23.7 |
| Three Authors             | 30              | 13.2 |
| More than three Authors   | 14              | 6.1  |
| No Authors                | 2               | 0.9  |
|                           | 228             | 100  |



The present study reveals that out of total 228 articles, 128 articles are contributed by single authors representing 56.1%. 54 articles represent double authors representing 23.7%. 30 & 14 articles are contributed by three authors and more than three authors accounting for 13.2% and 6.1% respectively. Remaining two articles have no authors instead published by institutions.

**Table-2**

| Major Publishers |  |                 |    |
|------------------|--|-----------------|----|
| Sl. No           | Publishers   | No. of Articles | %  |
| 1                | Taylor&Francis   | 24              | 26 |
| 2                | IGI Global, Hershey, PA  | 17              | 19 |
| 3                | Emerald Group Publishing Ltd.,                                     | 14              | 15 |
| 4                | Routledge/Taylor&Francis, Abing don                                | 13              | 14 |
| 5                | Association for the Advancement of Computing in Education (AACE)   | 8               | 9  |
| 6                | American Library Association, Chicago IL                           | 3               | 3  |
| 7                | Routledge/Taylor&Francis, UK                                       | 3               | 3  |
| 8                | Sage Publications. London UK                                       | 3               | 3  |
| 9                | Chartered Institute of Library and Information Professionals       | 2               | 2  |
| 10               | Int Assoc of School Librarianship, Zillmere, Queensland, Australia | 2               | 2  |

There are 50 total publishers, published 228 articles for the broad subject heading IT and School Education during the year 1985-2012. Table-2 shows top 10 ranking list of publishers under the criteria of number of article published.

**Table-3**

| Ranking of Core Journals  |      |                 |      |
|---|------|-----------------|------|
| Title Of Journals   | Rank | No. of Articles | %    |
| Technology, Pedagogy and Education  | 1    | 22              | 17.1 |
| Campus-Wide Information Systems   | 2    | 14              | 11.4 |
| International Journal of Information and Communication Technology Education | 3    | 11              | 8.9  |
| Journal of Information Technology for Teacher Education                     | 4    | 11              | 8.9  |
| Journal of Interactive Learning Research                                    | 5    | 11              | 8.9  |
| Journal of Educational Multimedia and Hypermedia                            | 6    | 8               | 6.5  |
| Internet @ Schools  | 7    | 7               | 5.7  |
| School Libraries Worldwide  | 8    | 6               | 4.9  |
| Computers in the Schools  | 9    | 3               | 2.4  |
| First Monday  | 10   | 3               | 2.4  |
| Information Technology for Development                                      | 11   | 3               | 2.4  |
| Journal of Educational Media and Library Sciences                           | 12   | 3               | 2.4  |

|  |    |   |     |
|--|----|---|-----|
| Knowledge Quest                        | 13 | 3 | 2.4 |
| Library & Information Science Research | 14 | 3 | 2.4 |
| Reference Services Review              | 15 | 3 | 2.4 |
| School Librarian                       | 16 | 3 | 2.4 |
| CILIP UPDATE with gazette              | 17 | 2 | 1.6 |
| Computers in Libraries                 | 18 | 2 | 1.6 |

Table -3 reviews the ranking of core journals by taking into account of the number of the article published during the year 1985-2012. It can be absorbed that the journal “Technology, Pedagogy and Education” ranks first publishing 22 articles (17.1%) followed by the journals “Campus-Wide Information Systems” representing 14 articles accounting for (11.4%). “International Journal of Information and Communication Technology Education, Journal of Information Technology for Teacher Education, and Journal of Interactive Learning Research” representing each 11 articles with 8.9% respectively. Journal of Educational Multimedia and Hypermedia, Internet @ Schools and School Libraries Worldwide securing 4, 5 & 6 place (6.5%) & 7 (5.7%) and (4.9%) respectively. Total 19.2% representing each 3 (2.4%) for 8 core journals namely Computers in the Schools, First Monday, Information Technology for Development, and Journal of Educational Media and Library Sciences, Knowledge Quest, Library & Information Science Research, Reference Services Review & School Librarian. Remaining 2 journals namely “CILIP UPDATE with gazette, and Computers in Libraries, accounting for total 3.2% with each 2 articles (1.6%).

**Table-4 Year Wise Distribution of Articles**

| Sl.No | Year Wise | No of Articles | In % |
|-------|-----------|----------------|------|
| 1     | 1985-1986 | 2              | 0.9  |
| 2     | 1993-1994 | 3              | 1.3  |
| 3     | 1995-1996 | 4              | 1.8  |
| 4     | 1997-1998 | 11             | 4.8  |
| 5     | 1999-2000 | 17             | 7.5  |
| 6     | 2001-2002 | 12             | 5.3  |
| 7     | 2003-2004 | 23             | 10.1 |
| 8     | 2005-2006 | 42             | 18.4 |
| 9     | 2007-2008 | 15             | 6.6  |
| 10    | 2009-2010 | 34             | 14.9 |
| 11    | 2011-2012 | 65             | 28.5 |
| Total | 22 Years  | 228            | 100  |

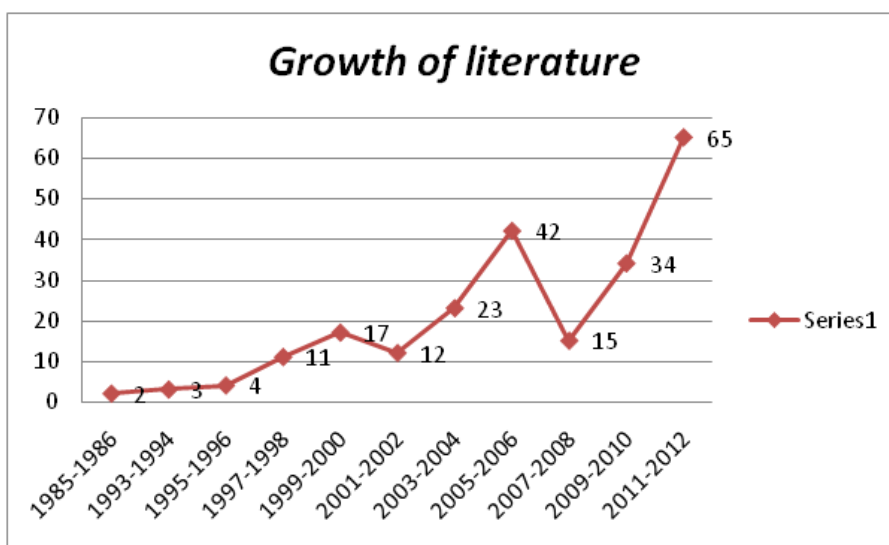


Table 4 provides the data published on IT use by school student from theyear 1985-2012. 0.9% articles published during the year 1985-1986, followed by 1.3% fromthe year 1993-1994 and 1.8% during the year 1995-1996. 4.8%, 7.5% and 5.3% articles published during the next three bi-annuals and 10.1% article growth shown in the year 2003-2004. 18.4%, 6.6%, 14.9% articles published during the year 2005-2006, 2007-2008, and 2009-2010respectively.

**Table 5: Document Wise Distribution on IT used by school students**

| Sl.No | Types of Documents | No, of Articles | Cumulative % | Rank |
|-------|--------------------|-----------------|--------------|------|
| 1     | Academic Journal   | 212             | 92.98        | 1    |
| 2     | Books              | 7               | 3.07         | 2    |
| 3     | Conferences        | 5               | 2.19         | 3    |
| 4     | Magazine           | 4               | 1.75         | 4    |
| Total |                    | 228             | 100.00       |      |

Table 5 represents the document wise distribution ofarticles on IT used by school studentsin the field of Academic use. It would be observed from the table that 212 (92.98%) articlespublished in academic journals followed by 7 (3.07%) books, 5(3.07%) conferences, and periodicals account to4(1.75%).

**Table-6: Publication Language**

| Language |                             |       |       |
|----------|-----------------------------|-------|-------|
| Rank     | Name of Language            | Total | %     |
| 1        | English                     | 222   | 97.37 |
| 2        | English/Chinese (Bilingual) | 2     | 0.88  |
| 3        | Danish                      | 2     | 0.88  |
| 4        | Chinese                     | 2     | 0.88  |
| Total    |                             | 228   | 100.0 |

Language as a medium of communication has a high impact on the dissemination of information to variety of users. English language appears to be the LINGUA FRANCH of Science & Technology. The table-6 demonstrates the dominant position of English language overridingother languages a long way behind. Representing 222 documents accountfor 97.37% of the total. Next in the rank are English/Chinese (bilingual), Danish and Chinese.

**Table-7: Subject/ Keyword**

| Rank | Subject Keyword                 | No of Key Word |
|------|---------------------------------|----------------|
| 1    | Educational Technology          | 80             |
| 2    | Information Technology          | 74             |
| 3    | IT Education                    | 67             |
| 4    | Teaching Educational Technology | 56             |
| 5    | Information Searches            | 53             |
| 6    | Software                        | 49             |
| 7    | E-Learning                      | 47             |
| 8    | Technology Tools                | 47             |
| 9    | Education; Teaching             | 45             |
| 10   | Electronic Resources            | 44             |

|    |                              |    |
|----|------------------------------|----|
| 11 | Teacher Training,            | 44 |
| 12 | Library Electronic Resources | 43 |
| 13 | World Wide Web               | 39 |
| 14 | New Technologies             | 39 |
| 15 | Classroom Instruction        | 39 |

The total number of assigned keywords was out of 1470 from total 228 research articles. The top fifteen keywords along with their frequency are presented in table-7. The total frequency of occurrence of top fifteen keywords is 727. Almost half of the total assigned 1470 keywords. These top fifteen keywords may therefore be regarded as core keywords in this subject domain. It is clear that the more study are done in this area.

It is evident from Table-7 above that the principal research interest in this area revolves around the keywords like Educational technology, Information technology, IT education, Teaching Educational technology, information searches, software, E-learning, technology tools, electronic resources, library electronic resources, World Wide Web, new technologies etc.

## FINDINGS

### The followings are the key findings of the present study:

- ❖ A total number of 228 articles on educational technology were published during the year 1985-2012.
- ❖ 30.40% articles on education technology, information technology and IT education focus significantly on IT use by school students.
- ❖ Academic journals and books primarily publish articles (95.98%) on IT used by school students
- ❖ Three authorship patterns (56.1%) found to be dominating feature in articles published on IT Used by school student for academic use.
- ❖ The year 2011-2012 saw publication growth of 28.5% which is 30 times more of compare to 1985-986(0.9%).
- ❖ Articles are predominantly published in English (97.39%) followed by English/Chinese, Danish and Chinese.
- ❖ Journal of Technology, Pedagogy and Education (17.1%) have published a greater number of articles on Educational technology and IT use for students.
- ❖ Researcher find that the more searched and used keyword are on “Educational technology(80), IT education (67).

## 5. CONCLUSIONS

The findings from the bibliometric analysis of research in IT in School environment imply a number of characteristics. The field has grown significantly after year 1985. The trend of increased production of published articles shows an exponential growth.

Using information technology for students is now very easy and accessing online resources for Academic work like project work, solving problems, communication, maps are now available to students directly. Computer, browsing, searching has become essential skills for all students, has recognition of the limitations of digital archives. The emergence of the IT responsiveness has acted to revitalize the generation of articles and contributions towards different aspects of IT for education and student use.

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