

Use of Technology in Distance Education – A Bibliographic Study

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Abstract

Current research paper speaks about the utilization of technology in distance education is the bibliographic study of Scopus indexed database. Various parameters like year wise publications, country wise publications, subject wise publications, based on sources, based on type of document, publications by Authors and publications by different funding agencies worldwide are considered for bibliographic analysis. Simple excel based charts are used as analysis tools.

Keywords

Distance education, Universities, technology, Learning, bibliography study.

Introductions

Advancement into the technology and widening of the scope of education sector has given new dimension to the distance education. As per Wikipedia Distance education is nothing but distance learning. This is the education process in which student may not always physically present in school or colleges. Traditionally these types of courses were known as

correspondence courses as student were corresponded with school/colleges through Postal Communication. A distance learning course can be completely distance learning or it incorporates traditional classroom learning also (Wikipedia, 2020). Now day's students are accessing course details using web enabled or application based technologies.

Flexible and choice based variety type of courses from worldwide renowned universities / institutes makes distance education more popular. It offers wide range of courses which incorporates certification courses to master level courses (Dhobale & Rath, 2012). Technology support to share course material using audio visual aids makes it more impactful. These technologies have great potential to promote distance learning environment. More personalized courses became reality (Technology enabled learning) because of these advancements.

Motivation

This study may give new insights to the various stakeholders associated with

Distance education / learning throughout the world. It also explores the research opportunities available in the domain area with respect to the studied parameters. It may give new research dimensions to the researchers.

Methodology

Bibliographic analysis is the use of statistical methods to analyze articles published in the database. Current research is the bibliographic analysis study conducted on Scopus indexed database. Title based key words are used to search the Scopus database and generated result are considered herewith as bibliographic analysis. MS Excel based graphs are used to represent and analyze generated data. Below mentioned seven parameters are considered for bibliographic analysis:

1. Year wise Publications.
2. Country/Territory wise publications.
3. Subject Area wise publications.
4. Document Type.
5. Contributing Authors.
6. Source Titles from Scopus database.
7. Funding Sponsors.

Bibliographic Analysis

Researcher used the keywords “Use of Technology in Distance Education” with Scopus database and accessed data till 09

March, 2020. Generated search result is analyzed herewith based on above mentioned seven parameters.

1. Year wise Publications :

Scopus database search result shows that total of 11262 documents were published from the year 1973 to near about first quarter of 2020. Maximum number of documents published during this time was in the year of 2011 and the number of publication in the year was 654. Below table shows the details of year wise publications.

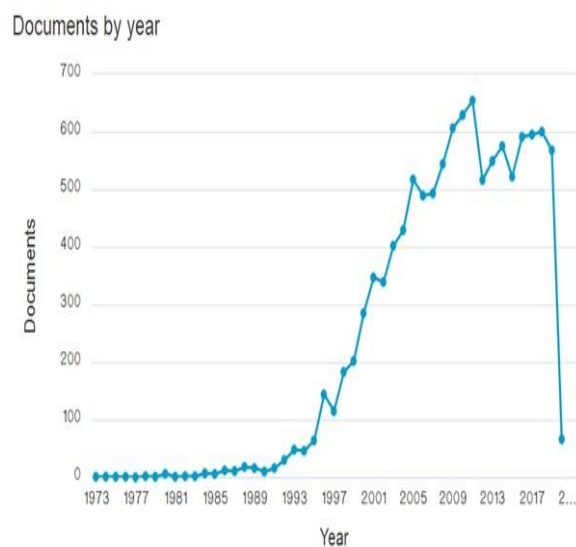
| Year | No of Publications |
|------|--------------------|
| 2020 | 66 |
| 2019 | 568 |
| 2018 | 600 |
| 2017 | 595 |
| 2016 | 591 |
| 2015 | 522 |
| 2014 | 575 |
| 2013 | 549 |
| 2012 | 516 |
| 2011 | 654 |
| 2010 | 629 |
| 2009 | 606 |
| 2008 | 544 |

| | |
|------|-----|
| 2007 | 493 |
| 2006 | 489 |
| 2005 | 517 |
| 2004 | 429 |
| 2003 | 402 |
| 2002 | 339 |
| 2001 | 347 |
| 2000 | 285 |
| 1999 | 202 |
| 1998 | 183 |
| 1997 | 115 |
| 1996 | 144 |
| 1995 | 64 |
| 1994 | 46 |
| 1993 | 48 |
| 1992 | 30 |
| 1991 | 16 |
| 1990 | 10 |
| 1989 | 16 |
| 1988 | 18 |
| 1987 | 11 |
| 1986 | 12 |
| 1985 | 6 |
| 1984 | 7 |
| 1983 | 2 |
| 1982 | 2 |

| | |
|------|---|
| 1981 | 1 |
| 1980 | 6 |
| 1979 | 1 |
| 1978 | 2 |
| 1976 | 1 |
| 1975 | 1 |
| 1974 | 1 |
| 1973 | 1 |

Table 1.1: Year wise Documents published.

Resulted data shows that from 1973 to till 1991 year wise documents publications were below 20 documents per year. Since 1996 to till 2019 it shows significant improvement in the number of documents published YOY basis. It shows linear increasing trend in the data.



Graph 1.1: Year wise Documents Published

2. Country / Territory wise Publications:

Resulted output data shows that published 11262 documents are from 148 countries / territories. Out of 11262 published documents 3584 are published by United States alone. China and United Kingdom are the major contributors after United States with 781 publications by each country. India published total of 306 documents and secure 8th position in the list after Brazil. Out of these 698 documents are from unspecified countries/territories.

| Country / Territory | No of Publications |
|---------------------|--------------------|
| United States | 3584 |
| China | 781 |
| United Kingdom | 781 |
| Australia | 567 |
| Canada | 431 |
| Spain | 369 |
| Brazil | 346 |
| India | 306 |
| Turkey | 289 |
| Russian Federation | 260 |
| Germany | 257 |
| Taiwan | 248 |
| Japan | 211 |
| South Africa | 203 |
| Greece | 190 |

| | |
|----------------|-----|
| Italy | 190 |
| France | 135 |
| Malaysia | 120 |
| Netherlands | 119 |
| Portugal | 116 |
| Sweden | 108 |
| Poland | 88 |
| Finland | 87 |
| South Korea | 79 |
| New Zealand | 78 |
| Indonesia | 72 |
| Ukraine | 71 |
| Iran | 70 |
| Mexico | 67 |
| Switzerland | 66 |
| Hong Kong | 65 |
| Norway | 65 |
| Nigeria | 62 |
| Croatia | 59 |
| Israel | 58 |
| Pakistan | 57 |
| Czech Republic | 56 |
| Singapore | 55 |
| Saudi Arabia | 53 |
| Romania | 48 |
| Austria | 45 |
| Belgium | 44 |
| Serbia | 44 |
| Slovenia | 44 |
| Ireland | 42 |
| Slovakia | 41 |
| Thailand | 40 |

| | |
|------------------------|----|
| Cyprus | 39 |
| Hungary | 38 |
| Colombia | 34 |
| Argentina | 31 |
| Denmark | 31 |
| United Arab Emirates | 30 |
| Egypt | 29 |
| Kazakhstan | 29 |
| Morocco | 29 |
| Jordan | 28 |
| Lithuania | 28 |
| Bulgaria | 24 |
| Philippines | 24 |
| Bangladesh | 23 |
| Ghana | 23 |
| Ecuador | 19 |
| Ethiopia | 19 |
| Latvia | 19 |
| Chile | 18 |
| Kenya | 18 |
| Algeria | 16 |
| Bosnia and Herzegovina | 16 |
| Tunisia | 16 |
| Botswana | 15 |
| Estonia | 15 |
| Oman | 15 |
| Cuba | 14 |
| Sri Lanka | 14 |
| Uganda | 14 |
| Tanzania | 13 |

| | |
|------------------------|----|
| Mauritius | 12 |
| Senegal | 12 |
| North Macedonia | 9 |
| Zimbabwe | 9 |
| Bahrain | 8 |
| Costa Rica | 8 |
| Fiji | 8 |
| Macedonia | 8 |
| Uruguay | 8 |
| Venezuela | 8 |
| Belarus | 7 |
| Guam | 7 |
| Iceland | 7 |
| Nepal | 7 |
| Peru | 7 |
| Qatar | 7 |
| Armenia | 6 |
| Georgia | 6 |
| Jamaica | 6 |
| Kuwait | 5 |
| Lebanon | 5 |
| Trinidad and Tobago | 5 |
| Viet Nam | 5 |
| Zambia | 5 |
| Azerbaijan | 4 |
| Libyan Arab Jamahiriya | 4 |
| Malta | 4 |
| Namibia | 4 |
| Palestine | 4 |
| Puerto Rico | 4 |
| Sudan | 4 |

| | |
|-----------------------------------|---|
| Albania | 3 |
| Burkina Faso | 3 |
| Cambodia | 3 |
| Macao | 3 |
| Malawi | 3 |
| Afghanistan | 2 |
| Barbados | 2 |
| Guatemala | 2 |
| Iraq | 2 |
| Lesotho | 2 |
| Luxembourg | 2 |
| Mali | 2 |
| Marshall Islands | 2 |
| Mongolia | 2 |
| Mozambique | 2 |
| Panama | 2 |
| Swaziland | 2 |
| Uzbekistan | 2 |
| Benin | 1 |
| Bhutan | 1 |
| Brunei Darussalam | 1 |
| Cameroon | 1 |
| Cape Verde | 1 |
| Cayman Islands | 1 |
| Comoros | 1 |
| Congo | 1 |
| Dominican Republic | 1 |
| El Salvador | 1 |
| Federated States of Micronesia | 1 |
| Haiti | 1 |
| Laos | 1 |

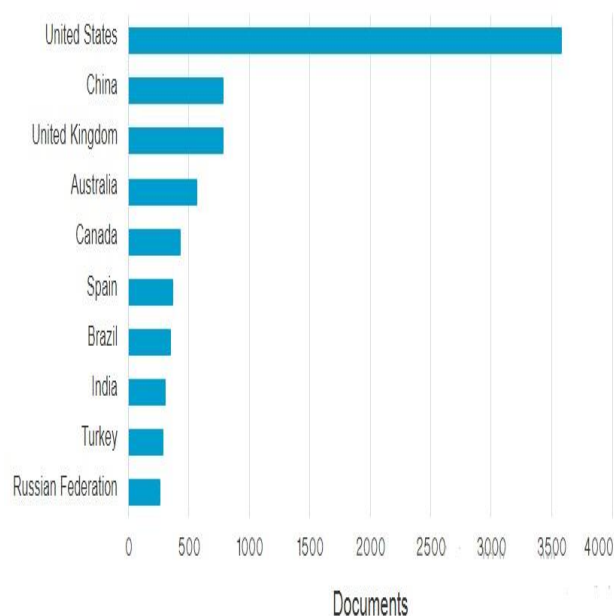
| | |
|------------------|-----|
| Liechtenstein | 1 |
| Mauritania | 1 |
| Myanmar | 1 |
| Palau | 1 |
| Papua New Guinea | 1 |
| Rwanda | 1 |
| Tajikistan | 1 |
| Yemen | 1 |
| Undefined | 698 |

Table 1.2: Country / Territory wise Documents Published.

Below bar graph shows first 15 major contributor countries / territories.

Documents by country or territory

Compare the document counts for up to 15 countries/territories.



Graph 1.2: Country /Territory wise Documents Published

3. Subject Area wise Publications:

All these published documents are divided into 28 subject areas. Out of these published documents major contribution in the area of Social Sciences with 5277 highest number of publications are reported. Computer science, Engineering and medicine subject wise publications are holding 2nd, 3rd and 4th position in the list.

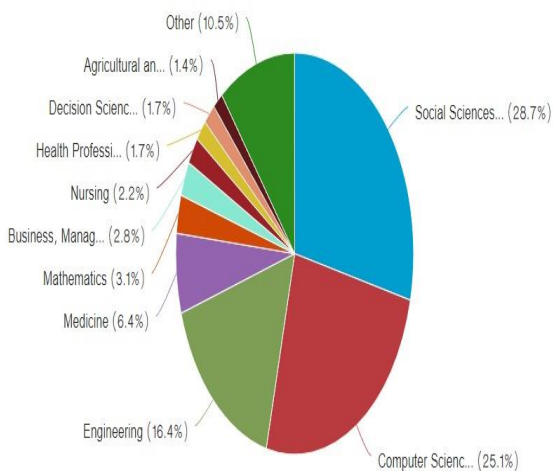
| Subject Area | No. of Documents Published |
|--------------------------------------|----------------------------|
| Social Sciences | 5277 |
| Computer Science | 4619 |
| Engineering | 3007 |
| Medicine | 1179 |
| Mathematics | 567 |
| Business, Management and Accounting | 510 |
| Nursing | 401 |
| Health Professions | 317 |
| Decision Sciences | 316 |
| Agricultural and Biological Sciences | 254 |
| Arts and Humanities | 253 |
| Physics and Astronomy | 240 |

| | |
|--|-----|
| Environmental Science | 203 |
| Materials Science | 188 |
| Psychology | 167 |
| Earth and Planetary Sciences | 141 |
| Biochemistry, Genetics and Molecular Biology | 139 |
| Economics, Econometrics and Finance | 119 |
| Energy | 112 |
| Dentistry | 65 |
| Chemistry | 64 |
| Pharmacology, Toxicology and Pharmaceutics | 63 |
| Chemical Engineering | 60 |
| Multidisciplinary | 40 |
| Veterinary | 32 |
| Neuroscience | 29 |
| Immunology and Microbiology | 12 |
| Undefined | 1 |

Table 1.3: Subject wise Documents Published.

Below Pi chart represents subject wise and its percentage contributions into the total publications.

Documents by subject area



Graph 1.3: Subject wise Percentage Contribution to Publications.

4. Document Type:

All published documents are listed into below mentioned 12 different types along with its contribution into the total publications. Major publications are in the form of Articles with 5110 highest number of publications and Conference Papers with 4623 publications. Least publications are in the form of Letter and Erratum with 3 and 1 publications respectively.

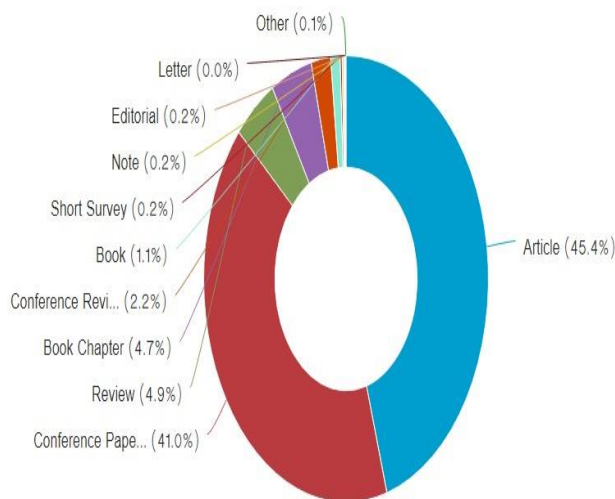
| Document Type | No of Publications |
|------------------|--------------------|
| Article | 5110 |
| Conference Paper | 4623 |
| Review | 555 |
| Book Chapter | 531 |

| | |
|-------------------|-----|
| Conference Review | 248 |
| Book | 121 |
| Short Survey | 25 |
| Note | 20 |
| Editorial | 17 |
| Letter | 3 |
| Erratum | 1 |
| Undefined | 8 |

Table 1.4: Types of Documents Published

Below mentioned Doughnut graph shows document type its percentage contribution to the total publications worldwide. More than 86% of publications are contributed together by Article and Conference papers.

Documents by type



Graph 1.4: Type of Document Publications along with Percentage

5. Contributing Authors:

Below mentioned table shows name of the Author along with their contribution to the total publications. Authors whose contribution is 4 and above documents in total publications are only considered for analysis purpose.

Major contributions are from Castro, M. and Shih, T.K. with 32 and 30 publications respectively.

| Author Name | No. of Publications |
|------------------|---------------------|
| Castro, M. | 32 |
| Shih, T.K. | 30 |
| Sancristobal, E. | 17 |
| Achuthan, K. | 13 |
| Gillet, D. | 12 |
| Peire, J. | 12 |
| Wuttke, H.D. | 12 |
| Gil, R. | 11 |
| Henke, K. | 11 |
| Kist, A.A. | 11 |
| Chang, W.C. | 10 |
| Chen, N.S. | 10 |

| | |
|----------------|----|
| Martin, S. | 10 |
| Okamoto, T. | 10 |
| Pullen, J.M. | 10 |
| Zhao, J.C. | 10 |
| Chen, X. | 9 |
| Diwakar, S. | 9 |
| Eaton, K.A. | 9 |
| Latchem, C. | 9 |
| Meinel, C. | 9 |
| Tawfik, M. | 9 |
| Bandung, Y. | 8 |
| Goosen, L. | 8 |
| Gáti, J. | 8 |
| Kirkwood, A. | 8 |
| Kose, U. | 8 |
| Kártyás, G. | 8 |
| Mehrabian, A. | 8 |
| Mkrttchian, V. | 8 |
| Nedic, Z. | 8 |
| Petre, M. | 8 |
| Baggaley, J. | 7 |
| Bouras, C. | 7 |

| | |
|------------------------|---|
| Caminero, A.C. | 7 |
| Cristea, A. | 7 |
| Esche, S.K. | 7 |
| Gadbury-Amyot, C.C. | 7 |
| Gallagher-Lepak, S. | 7 |
| Garcia-Zubia, J. | 7 |
| Guo, J.X. | 7 |
| Hung, J.C. | 7 |
| Kinshuk | 7 |
| Lewis, V.W. | 7 |
| Locatis, C. | 7 |
| Nair, B. | 7 |
| Ragusa, A.T. | 7 |
| Sell, R. | 7 |
| Sharma, R.C. | 7 |
| Tovar, E. | 7 |
| Ahmad, H. | 6 |
| Alsmadi, M. | 6 |
| Anastasiades, P.S. | 6 |
| Behar, P.A. | 6 |
| Billings, D.M. | 6 |

| | |
|---------------------|---|
| Car, J. | 6 |
| Colace, F. | 6 |
| Crampton, A. | 6 |
| De Santo, M. | 6 |
| Deng, L.Y. | 6 |
| Dormido, S. | 6 |
| Fedoruk, P. | 6 |
| Fidan, I. | 6 |
| García-Magariño, I. | 6 |
| Guillén-Gámez, F.D. | 6 |
| Hashim, R. | 6 |
| Hayes, M.H. | 6 |
| Helbo, J. | 6 |
| Hernández, R. | 6 |
| Hiltz, S.R. | 6 |
| Hovenga, E.J.S. | 6 |
| Hsu, H.H. | 6 |
| Hussain, I. | 6 |
| Karim, A. | 6 |
| Kumar, D. | 6 |
| Li, Q. | 6 |
| Li, S.T. | 6 |

| | |
|------------------------------|---|
| Liang, J.S. | 6 |
| Lin, N.H. | 6 |
| Liu, Q. | 6 |
| Maddux, C.D. | 6 |
| Meletiou- Mavrotheris, M. | 6 |
| Mohammed, T. | 6 |
| Moslehpour, S. | 6 |
| Murphy, A. | 6 |
| Rahrooh, A. | 6 |
| Springer, M.L. | 6 |
| Abdullah, C.Z. | 5 |
| Ackerman, M. | 5 |
| Anderson, T. | 5 |
| Basak, H.H. | 5 |
| Berge, Z.L. | 5 |
| Bernard, R.M. | 5 |
| Boulet, M.M. | 5 |
| Bremgartner, V. | 5 |
| Buchanan, W. | 5 |
| Chang, H.B. | 5 |

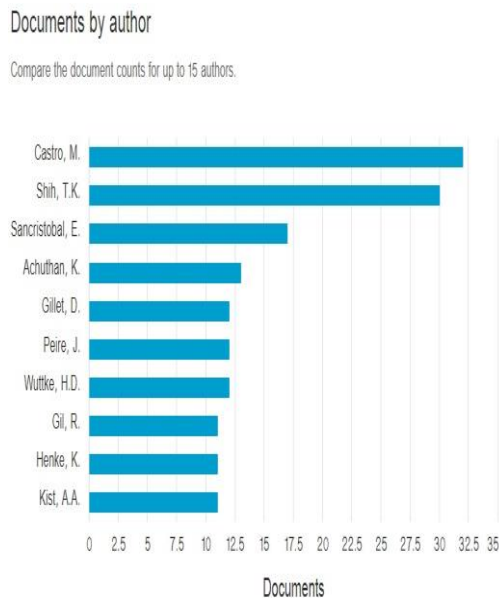
| | |
|---------------------------|---|
| Charbonneau- Gowdy, P. | 5 |
| Chassapis, C. | 5 |
| Chen, T.H. | 5 |
| Cherner, Y. | 5 |
| Cohen, M.S. | 5 |
| Colmenar, A. | 5 |
| Cook, D.A. | 5 |
| Crossman, G.R. | 5 |
| Curran, V.R. | 5 |
| Dafoulas, G.A. | 5 |
| Danchak, M.M. | 5 |
| Davidson, B. | 5 |
| Davis, N. | 5 |
| Dormido, S. | 5 |
| Drigas, A. | 5 |
| Ellis, T.J. | 5 |
| Eppes, T. | 5 |
| Esquembre, F. | 5 |
| Evans, T. | 5 |
| Farley, H. | 5 |
| Fransson, T.H. | 5 |

| | |
|---------------|---|
| Gay, G. | 5 |
| Gil, M.C. | 5 |
| Gregory, S. | 5 |
| Griffiths, R. | 5 |
| Hakala, I. | 5 |
| Holland, S. | 5 |
| Ingraffea, A. | 5 |
| Iyer, S. | 5 |
| Jeschke, S. | 5 |
| Jung, I. | 5 |
| Kauffmann, P. | 5 |
| Kear, K. | 5 |
| King, F.B. | 5 |
| Kirkup, G. | 5 |
| Koizumi, H. | 5 |
| Lane, A. | 5 |
| Lebedev, A.A. | 5 |
| Lee, M.J.W. | 5 |
| Li, P. | 5 |
| Lindner, J.R. | 5 |
| Lishou, C. | 5 |
| Machado, L.R. | 5 |

| | |
|--------------------|---|
| Mason, R. | 5 |
| Maxwell, A.D. | 5 |
| Mishra, S.K. | 5 |
| Ortelt, T.R. | 5 |
| Orueta, G.D. | 5 |
| Roselli, T. | 5 |
| Rossano, V. | 5 |
| Schaefer, D. | 5 |
| Tekkaya, A.E. | 5 |
| Uskov, V. | 5 |
| Vaganova, O.I. | 5 |
| Xenos, M. | 5 |
| Abrami, P.C. | 4 |
| Ajhoun, R. | 4 |
| Aleksic-Maslac, K. | 4 |
| Angulo, I. | 4 |
| Antoniou, P. | 4 |
| Anwar, S. | 4 |
| Arndt, T. | 4 |

Table 1.5: Authors and their Contributions

Below shown bar graph represent top 15 Authors with their contribution to the total publications.



Graph 1.5: Top 15 Author and their Contributions

6. Source Titles from Scopus Database:

Scopus generated results shows that those results are from different data sources indexed in Scopus across the World. Below table shows 126 types of different sources from where minimum 9 and above documents are contributed. Top ranked sources are “Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics” and “Turkish Online Journal of Distance Education” with 171 publications from each source.

| Source Title | No. of Publications |
|--|---------------------|
| Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics | 171 |
| Turkish Online Journal Of Distance Education | 171 |
| Proceedings Frontiers In Education Conference Fie | 135 |
| Computers And Education | 126 |
| Proceedings Frontiers In Education Conference | 123 |
| International Review Of Research In Open And Distance Learning | 118 |
| Distance Education | 99 |
| ACM International Conference Proceeding Series | 80 |
| Communications In Computer And Information Science | 79 |
| Studies In Health Technology And Informatics | 79 |
| British Journal Of Educational Technology | 66 |
| Advances In Intelligent Systems And Computing | 60 |
| Turkish Online Journal Of Educational Technology | 58 |
| Ceur Workshop Proceedings | 53 |
| Educational Technology And Society | 52 |
| Proceedings Of SPIE The International Society For Optical Engineering | 51 |
| International Journal Of Emerging Technologies In Learning | 47 |

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|--|----|
| IFIP Advances In Information And Communication Technology | 46 |
| International Journal Of Continuing Engineering Education And Life Long Learning | 43 |
| International Journal Of Distance Education Technologies | 43 |
| Internet And Higher Education | 42 |
| International Journal Of Phytoremediation | 41 |
| Advanced Materials Research | 40 |
| Applied Mechanics And Materials | 39 |
| Open Learning | 39 |
| Telemedicine And E Health | 39 |
| Computer Applications In Engineering Education | 37 |
| Nurse Education Today | 37 |
| International Journal Of Engineering Education | 32 |
| Journal Of Library Administration | 32 |
| International Journal Of Online Engineering | 31 |
| European Journal Of Engineering Education | 30 |
| IEEE Transactions On Education | 30 |

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|--|----|
| Medical Teacher | 30 |
| Journal Of Medical Internet Research | 28 |
| American Journal Of Pharmaceutical Education | 27 |
| Journal Of Nursing Education | 27 |
| Procedia Social And Behavioural Sciences | 27 |
| Techtrends | 26 |
| Lecture Notes In Electrical Engineering | 25 |
| Proceedings ACM SIGUCCS User Services Conference | 25 |
| Journal Of Physics Conference Series | 24 |
| Nurse Educator | 24 |
| Education And Information Technologies | 23 |
| Journal Of Dental Education | 23 |
| Educational Media International | 22 |
| IFAC Proceedings Volumes IFAC Papers online | 22 |
| Journal Of Library And Information Services In Distance Learning | 22 |
| Proceedings Of The IASTED International Conference On Computers And Advanced Technology In Education | 22 |
| BMC Medical Education | 21 |
| CIN Computers Informatics Nursing | 21 |
| Educational Technology Research And Development | 21 |

| | |
|--|----|
| International Journal Of Medical Informatics | 21 |
| Journal Of Telemedicine And Telecare | 21 |
| Journal Of Veterinary Medical Education | 21 |
| IEEE Transactions On Learning Technologies | 20 |
| Journal Of Continuing Education In The Health Professions | 20 |
| Campus Wide Information Systems | 19 |
| Computers In The Schools | 19 |
| IEEE International Professional Communication Conference | 19 |
| Journal Of Asynchronous Learning Network | 19 |
| Journal Of Continuing Education In Nursing | 19 |
| Journal Of Professional Nursing | 19 |
| Journal Of Teaching In Social Work | 19 |
| Procedia Computer Science | 17 |
| Proceedings IEEE International Conference On Advanced Learning Technologies Icalt 2004 | 17 |
| American Journal Of Distance Education | 16 |
| Espacios | 16 |
| International Journal Of Information And Communication Technology Education | 16 |
| SIGCSE Bulletin Association For Computing Machinery Special Interest Group On Computer Science Education | 16 |

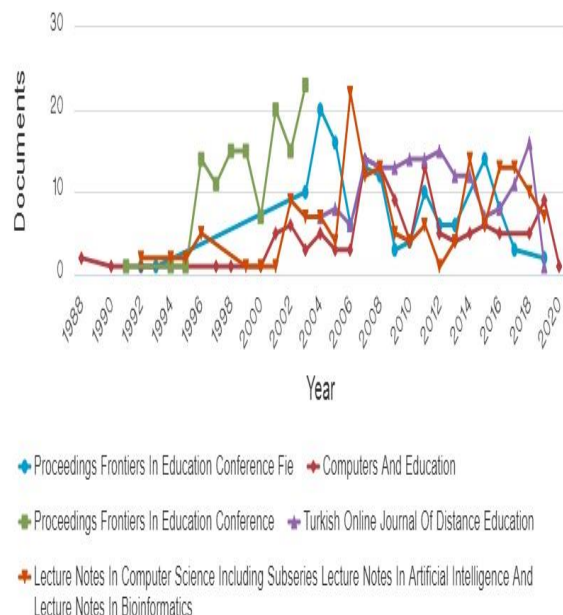
| | |
|--|----|
| Advances In Intelligent And Soft Computing | 15 |
| International Journal On E Learning Corporate Government Healthcare And Higher Education | 15 |
| Journal Of Medical Systems | 15 |
| Journal Of Technology In Human Services | 15 |
| Smart Innovation Systems And Technologies | 15 |
| Acta Horticulturae | 14 |
| Education For Information | 14 |
| Gerontology And Geriatrics Education | 14 |
| Open Learning The Journal Of Open Distance And E Learning | 14 |
| Academic Medicine | 13 |
| Computers In Education Journal | 13 |
| Library Hi Tech News | 13 |
| Computers In Human Behaviour | 12 |
| Computers In Nursing | 12 |
| Conference On Human Factors In Computing Systems Proceedings | 12 |
| Higher Education | 12 |
| Horttechnology | 12 |
| Iop Conference Series Materials Science And Engineering | 12 |

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|---|----|
| Journal Of Educational Computing Research | 12 |
| Lecture Notes Of The Institute For Computer Sciences Social Informatics And Telecommunications Engineering Lnicst | 12 |
| Life Science Journal | 12 |
| Mediterranean Journal Of Social Sciences | 12 |
| Nursing Education Perspectives | 12 |
| Proceedings Electronic Components And Technology Conference | 12 |
| Proceedings Of The Hawaii International Conference On System Sciences | 12 |
| Proceedings Of The Seventh IASTED International Conference On Computers And Advanced Technology In Education | 12 |
| Revista Da Escola De Enfermagem | 12 |
| Wseas Transactions On Information Science And Applications | 12 |
| European Journal Of Dental Education | 11 |
| International Journal Of Learning | 11 |
| Journal Of Cases On Information Technology | 11 |
| Journal Of Coastal Research | 11 |
| Journal Of Educators Online | 11 |
| Journal Of Information Systems Education | 11 |
| Multimedia Tools And Applications | 11 |
| Rural And Remote Health | 11 |

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| Teoriya I Praktika Fizicheskoy Kultury | 11 |
| Educacao E Sociedade | 10 |
| Journal Of Computational Information Systems | 10 |
| Journal Of Computer Assisted Learning | 10 |
| Journal Of Computer Information Systems | 10 |
| Journal Of Education For Business | 10 |
| Journal Of Science Education And Technology | 10 |
| Journal Of Social Work Education | 10 |
| Learning Media And Technology | 10 |
| Pacific Health Dialog | 10 |
| Proceedings Annual Meeting Of The Decision Sciences Institute | 10 |
| Technology Pedagogy And Education | 10 |
| Australasian Journal Of Educational Technology | 9 |
| Australian Journal Of Rural Health | 9 |
| British Dental Journal | 9 |
| Community College Journal Of Research And Practice | 9 |
| Education Policy Analysis Archives | 9 |
| Electronic Journal Of E Learning | 9 |
| Electronic Library | 9 |
| Eurasia Journal Of Mathematics Science And Technology Education | 9 |

Table 1.6: Source Titles with Publication Contribution

Graph represented below shows major 5 source contributors with their year wise contribution to the Scopus database.



Graph 1.6: Top 5 Source Contributor with Year wise Publications.

7. Funding Sponsors:

Throughout the world total of 159 funding and sponsors supported for the publications. National Science Foundation is the major contributor with 83 publications.

| Sponsors | No. of Publication |
|--|--------------------|
| National Science Foundation | 83 |
| European Commission | 48 |
| National Natural Science Foundation of China | 43 |

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|---|----|
| National Science Council | 18 |
| Health Resources and Services Administration | 14 |
| U.S. Department of Health and Human Services | 14 |
| National Institutes of Health | 13 |
| U.S. Department of Education | 13 |
| Social Sciences and Humanities Research Council of Canada | 10 |
| Japan Society for the Promotion of Science | 8 |
| Russian Foundation for Basic Research | 8 |
| National Basic Research Program of China (973 Program) | 7 |
| Conselho Nacional de Desenvolvimento Científico e Tecnológico | 6 |
| Ministry of Human Resource Development | 6 |
| National Aeronautics and Space Administration | 6 |
| Natural Sciences and Engineering Research Council of Canada | 6 |

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|---|---|
| Open University | 6 |
| Alfred P. Sloan Foundation | 5 |
| Australian Research Council | 5 |
| Defense Advanced Research Projects Agency | 5 |
| Economic and Social Research Council | 5 |
| Fundamental Research Funds for the Central Universities | 5 |
| Higher Education Funding Council for England | 5 |
| International Development Research Centre | 5 |
| Ministry of Education and Science of the Russian Federation | 5 |
| Agency for Healthcare Research and Quality | 4 |
| Bundesministerium für Bildung und Forschung | 4 |
| Centres for Disease Control and Prevention | 4 |
| Conselho Nacional de Desenvolvimento Científico e Tecnológico | 4 |

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|---|---|
| Council on grants of the President of the Russian Federation | 4 |
| Department of Health, Australian Government | 4 |
| Engineering and Physical Sciences Research Council | 4 |
| European Regional Development Fund | 4 |
| European Social Fund | 4 |
| Honeywell Hometown Solutions | 4 |
| Joint Information Systems Committee | 4 |
| Lee Kong Chian School of Medicine, Nanyang Technological University | 4 |
| Ministerio de Ciencia e Innovación | 4 |
| National Research Foundation of Korea | 4 |
| Seventh Framework Programme | 4 |
| Telecommunications Advancement Foundation | 4 |
| U.S. Department of Agriculture | 4 |
| U.S. Department of Energy | 4 |

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| Universidad Nacional de Educación a Distancia | 4 |
| Amrita Vishwa Vidyapeetham University | 3 |
| Australian Education International, Australian Government | 3 |
| Bill and Melinda Gates Foundation | 3 |
| Canadian Institutes of Health Research | 3 |
| China Postdoctoral Science Foundation | 3 |
| Coordenação de Aperfeiçoamento de Pessoal de Nível Superior | 3 |
| Curtin University of Technology | 3 |
| Department for International Development | 3 |
| Division of Undergraduate Education | 3 |
| Fundación para la Investigación y la Prevención del Sida en España | 3 |

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| Fundação de Amparo à Pesquisa do Estado de São Paulo | 3 |
| Fundação para a Ciência e a Tecnologia | 3 |
| Fundação de Amparo à Pesquisa do Estado de São Paulo | 3 |
| IEEE Foundation | 3 |
| International Atomic Energy Agency | 3 |
| Michigan State University | 3 |
| Ministerio de Ciencia y Tecnología | 3 |
| Ministry of Science and Technology, Taiwan | 3 |
| Ministry of Transport of the People's Republic of China | 3 |
| Nanyang Technological University | 3 |
| National Healthcare Group | 3 |
| National Research Foundation | 3 |
| National Sleep Foundation | 3 |
| Office of Naval Research | 3 |

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| Substance Abuse and Mental Health Services Administration | 3 |
| U.S. National Library of Medicine | 3 |
| U.S. Public Health Service | 3 |
| United Nations Educational, Scientific and Cultural Organization | 3 |
| United States Agency for International Development | 3 |
| World Bank Group | 3 |
| AADE Education and Research Foundation | 2 |
| Aeronautical Science Foundation of China | 2 |
| Air Force Office of Scientific Research | 2 |
| American Alliance for Health, Physical Education, Recreation, and Dance | 2 |
| Asian Development Bank | 2 |
| British Council | 2 |
| Canada Research Chairs | 2 |
| Center for Nanoscience and Nanobiotechnology, Boston University | 2 |

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| China Scholarship Council | 2 |
| Collaboration for Leadership in Applied Health Research and Care - Greater Manchester | 2 |
| Department of Electronics and Information Technology, Ministry of Communications and Information Technology | 2 |
| Deutsche Forschungsgemeinschaft | 2 |
| Deutscher Akademischer Austauschdienst | 2 |
| Diabetes Research and Training Center | 2 |
| Erasmus+ | 2 |
| Faculty of Medicine, Nursing and Health Sciences, Monash University | 2 |
| Federal Office of Rural Health Policy | 2 |
| Florida Gulf Coast University | 2 |
| Fuel Cell Technologies Program | 2 |

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| Fundação para a Ciência e a Tecnologia | 2 |
| Henan Province University Innovation Talents Support Program | 2 |
| Horizon 2020 | 2 |
| Horizon 2020 Framework Programme | 2 |
| Imperial College London | 2 |
| Institute of Education Sciences | 2 |
| Instituto de Salud Carlos III | 2 |
| Medical Research Council | 2 |
| Ministerio de Economía y Competitividad | 2 |
| Ministry of Education | 2 |
| Ministry of Education and Science | 2 |
| Ministry of Education and Science of the Republic of Kazakhstan | 2 |
| Ministry of Health | 2 |
| Ministry of Science, ICT and Future Planning | 2 |
| National Heart, Lung, and Blood Institute | 2 |

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| National Institute of Mental Health | 2 |
| National Institute of Neurological Disorders and Stroke | 2 |
| National Institute on Aging | 2 |
| National Institute on Disability and Rehabilitation Research | 2 |
| Newcastle University | 2 |
| Office for Learning and Teaching | 2 |
| Peking University | 2 |
| Research Executive Agency | 2 |
| Science and Technology Major Project of Guangxi | 2 |
| Teaching and Learning Research Initiative | 2 |
| Thailand Development Research Institute | 2 |
| U.S. Department of Defence | 2 |
| Universidad Nacional de Educación a Distancia | 2 |
| Universidad Nacional de Rosario | 2 |
| Universidad Politécnica de Madrid | 2 |

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| University Grants Committee | 2 |
| University of Adelaide | 2 |
| University of Arizona | 2 |
| University of Birmingham | 2 |
| University of Bristol | 2 |
| University of Hawai'i | 2 |
| University of Hong Kong | 2 |
| University of North Carolina | 2 |
| University of Patras | 2 |
| University of Wyoming | 2 |
| VINNOVA | 2 |
| World Health Organization | 2 |
| Yerkes Regional Primate Research Center | 2 |
| AUTO21 Network of Centres of Excellence | 1 |
| Abdus Salam International Centre for Theoretical Physics | 1 |
| Academy of Certified Archivists | 1 |
| Academy of Finland | 1 |
| African Studies Association | 1 |
| Agence Nationale de la Recherche | 1 |

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| Agencia Antidroga de la Comunidad de Madrid | 1 |
| Agentschap voor Innovatie door Wetenschap en Technologie | 1 |
| Agència de Gestió d'Ajuts Universitaris i de Recerca | 1 |
| Air Force Institute of Technology | 1 |
| Air Force Research Laboratory | 1 |
| Alabama Commission on Higher Education | 1 |
| All-India Institute of Medical Sciences | 1 |
| American Board of Orthopaedic Surgery | 1 |
| American College of Physicians | 1 |
| American Dental Education Association | 1 |
| American Dietetic Association Foundation | 1 |
| American Eagle Foundation | 1 |
| American Heart Association | 1 |
| American Laryngological Association | 1 |

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| American Research Center in Sofia | 1 |
| American Society of Cytopathology Foundation | 1 |
| American Society of Mechanical Engineers | 1 |

Table 1.7 - Funding Sponsors and Publication from them

Below Graph shows top 10 sponsors and their contributions to the publications.



Graph 1.7 – Top 10 Funding Sponsors with their Publications

Conclusion

Current bibliographic analysis shows that after advancement into the technology there is increase into the publications contributions. Developed and developing countries are the major contributor to the publications.

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