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EVALUATING THE RESEARCH FUNDING OPPORTUNITIES FOR LIBRARY & INFORMATION SCIENCE PROFESSIONALS: AN EVALUATIVE STUDY

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Abstract

This research paper highlights the top twenty research funding agencies of the world in the discipline of Information Science and Library Information Science. The citation analysis method has been adopted for the present study and used the database Web of Science and InCites. The aim of this research paper is to make aware research scholars, faculty members, LIS professional and Practitioners, and policymakers about the various National and International top-level funding agencies available to fund their research proposals. The research and academic fraternity and particularly the library professionals who always face problems to get funds to work on any project will able to start new research with innovative ideas with the help of research grant. The finding of the study gives the insight of top-level research funding data with publication ratio of funded research publications in both Open and Closed access journals covered by WoS and InCites bibliographic Database. This paper also focused on the collaboration pattern of funded research publications.

Keywords: Funding agency, WoS documents, Impact, Collaboration, Productivity, Research Grant/Fund.

Introduction

An idea came out during observation, interaction with peers or coming out to a problem with the solution takes shape only after the research. Researching a particular idea needs a lot of efforts, human resources and financial support. This financial support comes from the Government and philanthropical society if the outcome is beneficial for masses and from the Industries if there is the financial gain from the result. Nowadays, most of the research going on worldwide are supported by research funding agencies. The race to provide vaccine of pandemic COVID-19 to humanity explain the above. At one hand World Health Organization, government and philanthropical society like Bill & Milinda Gates Foundation are supporting this mission for humanity and on the other hand research funding to BioNTech- Pfizer is for financial benefit. However, ultimately people will be benefited.

Research funding could be a word typically covering each and every donation for R & D activities, within the scope of natural science, Information and technology, engineering or any discipline. The word funding include huge

comparative process through which a research scholars gets fund such as valuable outputs project and potential and last research activity for world that will reicive funding. The contribution of Industries in research funding is increasing day by day due to the required new technology to sustain in the market. As stated by OECD, most of the 60% of R&D progress in Science and technology disciplies is covered by manufacturing companies, 10 to 20% research carried out in Academic Institutions and organization & Juridisction (OECD, 2015)[1]. Relatively, in countries with less GDP like a European country and the United Mexican States, the trade participation is considerably very less. The Govt. Research funding percentage are higher for manufacturing companies, its impact on R & D activies of research scholars and practitioners. In business analysis and evolultion, about the foremost R & D companies concentereted on exploitation potentialities instead of "blue-sky" ideas or technologies like fusion (Taylor, 2012)[2].

However, all the Governments around the world has created a vast infrastructure in Sciene and Technoglies Labs for R & D activities, the important foundation of research scholars in technologies and science then academics institutions and Govt. And Non-Govt. research centers. The expenditure Varies from country to country on research. Such as in 2018, the US spent 2.8% of GDP on research and development (R&D), Korea 4.5%, GDP 4.9% is spend on R and D in Israel. In contrast, Saudi Arabia spends 0.8% of GDP, UK spends 1.7%, China spends 2.1%, and India spends 0.7% of GDP on Research and Development activity of country (UNESCO and OECD)[3,1].

Generally, researchers appeal for research spports funding with a recognize funding agency which may be approved to financial help. The sanction of funds is a huge procdure. The funding agency can inquire about the research scholar's interest area with his/her previous research activities, the infrastructure required for research, the facilities used, duration of a research project and overall valuable output of study etc. As per the interest area of funding agencies, research scholars prepare research projects and apply for the fund for their research activities. Most of the research funds related to the library sector come through the national or quasi-national Government granting agency. Only a few countries like the UK receives significant grant for Library and Information Science analysis from a Library Science particular institutions and centers. Business funding is rare in LIS that is somewhat stunning as a result of one would expect that giant program and business list information suppliers would fund analysis on IR systems (Zhao, 2010)[4]. However, (Heinze, 2008)[5] was optimistic that comparative basis grant protocall would facilitate come out with the most effective concepts and ideas. As this

paper focuses on the top twenty research funding agencies of Worldwide, it will help to research scholars searching the funding agencies for their research activities.

Review of literature

Lot of literature available on the research funds and analyzing various aspects of funding grants, their Impact on research in different disciplines. But very few studies have so far been conducted analyzing the top-level research funding data with publication ratio of funded research publications in both Open and Closed access journals. *Wu Jiang* analyzed 193517 funded interdisciplinary research projects of the National Science Foundation of China. They concluded that the knowledge base information flow network isn't solely to small scope; however, conjointly a scale-free scope. There are two major information strem ways out of scientific divisions exist, expressing the heterogeneousness of data disseminations over the filed of science and technology (Wu Jiang et al. 2018)[6].

A study was done by *Ebikobowei, Baro* et al. studied on research funding opportunities and challenges of academic staff members in Nigerian Tertiary Institutions. The result of the survey shows that amid the granting institute comments, Universities and R&D scholars got highest fund TETFund (Tertiary Education Trust Fund) other than any other agency. This study also revealed some barrier to accessing research grants and ranked first as biasness in granting and elected reseach of proposal, second as lack of Publicity or advertisement of research funding projects, and third as less aware about graning organizations or agencies. Inadequate writing a research synopsis ranked on forth postion amid the barrier. He also suggested training programme on how to write a research funding proposal to cross these barriers(Ebikobowei, et al. 2017)[7].

Zhao, Dangzhi find out that the effect of research funded scholarly work as considered by citation/references analysis was considerably on top of that of alternative analysis. Reserch Scholars and experts from out of Library Science main establishments participated highly to allocated funded project. The second last major effect research publications were non-funded research project and grant depended funding of scholarly projects rumoured in major Library science research journals was unfaired about the data retrieval (IR) space, notably towards analysis on IR systems. The heights number of research papers showing that the funded research project activity was foused in Information-generated journals than library highlighted ones (Zhao, 2010)[4].

During the analysis of the study, a well built connection observed within research grant and various research results. The patent trend analysis and Bibliometric analysis shows thedelay in time withing grant and patents problesm proof. Also, find out that research results of this study is that same type of fashion/trends and were also find out that interdependent as proof from mathematical analysis. (Daim, et al. 2007)[8].

Frolinch, Nicoline et al. examined the influence of funding systems on higher education institutions and their strategies and core tasks. He has implemented the mixed funding models in the county. Also find out that no major differences in weaknesses, strength, and effects of the two major types of grants system, one is input-based another one is output-based funding studied in theis research paper. (Frolinch, et al. 2010)[9].

Jefferson, Therese find out that Contract research arrangements haveapplication that are less important as compare to those related with scholarly journals rankings and heterodox economists should have concentereted on the finding towards provisions that fascinated to research grant/finding. (Jefferson, 2008)[10].

Glick, Scott revealed that finding agencies have to elaborate the area of historic archive perpetuated funds to cover highly advancement research. Integrated development in the area of implementation based proportion will guarantee that research grant reached intention while became greater historic historic building performance (Glick, 2013)[11].

Jowkar examined the reference effect of Iranian grant based research disseminations and publications compared the non-funded publication of research, in which 12.5% of Iranian funded based research . Also, find out the how many funded research had increased dramatically in last 4 years. The reference/citation effects of grant based research publication was bigger in around all the disciplince. The largest percentages of grant base reseaech publication belonged to the academics institutes various subordinate to The Ministry of Science, Research and Technology (Jowkar, 2011)[12].

The study carried out by the *Ekoja* find out that largest number of respondens such as empoyers and international agencies have supported either self-funded or funded research . also find out that research funds and research allowances has guide towards the qualitative research outputs (Ekoja, 1999)[13].

Ramkumar, S. and Narayanasamy N. analyzed collaboration and networking in research grant project of the research fund of the All Indian Institute of Speech Hearing. The output of the study shows that domestic and

international collaborations witnessed an increase in recent years, and networking increased between junior and senior faculty (Ramkumar and Narayanasamy 2017)[14].

In a study carried out by *Gondaliya and Shah* covering all Government and non-government funding agencies of India to describing the objectives, type of schemes, contact address, how to write a proposal for funded research projects, components of a grant, items not allowed etc. of selected Govt. and Non-govt funding agencies of India (Gondaliya and Shah 2013)[15].

Objectives of the present study

The primary goal of present research study is to make aware of library fraternity about the various research funding agencies available worldwide in the Library and Information Science field/discipline. The present research study also highlights the funded research publications in various scholarly journals and their Impact. The following specific objectives have been formulated to achieve the target of the present research study:

- To find out top twenty research finding agencies in on the basis of documents cited,
- To determine publications pattern (Closed / Open Access publication),
- To find out Impact of the funded research agencies publications,
- To find out the productivity of the funded research agencies publications and
- To find out the collaboration pattern of the funded research publications.

Scope

The present study scope is limited to top twenty research funding agencies of the worldwide in the Library and Information Science field/discipline. The databases Web of Science and InCites have been used to examine the top research funding agencies and their citation study.

Methodology

This study adopted the citation analysis research method and examined the top twenty research funding agencies from 1999-2019. Research data collected through Web of Science and InCites Database Which is prepared based on objectives of the present study. Microsoft Word and MS-Excel have been used for data analysis and Interpretation. For the review of top twenty research funding agencies, Web of Science (Wos) and InCites Database used (InCites Dataset updated Jul 10, 2020. Includes Web of Science content indexed through

May 31, 2020.), using query (*Dataset: InCites Dataset + ESCI; Schema: Web of Science; Time Period: [1999, 2019]; Research Area: [INFORMATION SCIENCE & LIBRARY SCIENCE]; Funding Agency Type: Funded)*. The researcher has exported this data on Jul 20 2020. The data collected are presented in the form of tables and percentages under various headings.

Need and Significant of the study:

This study revealed the top-level funding agencies selected by the researchers, scientists and Library professionals for better research activity and innovation in the Library and Information Science field in the world. This study will be useful in selecting the top-level research funding agencies and also Q1 and Q2 Journals of Web of Science (WoS) in the Library and Information Science field/discipline. The research will come to know the higher funded and top-level research funding agencies.

Data analysis and Interpretation

Web of Science Documents

In Table 1, the top twenty funding agencies ranking has been done based on a number of documents cited. In general view quality research paper getting the maximum number of citations. The National Institutes of Health (NIH) - USA is leading in the ranking followed by National Natural Science Foundation (NNSF) - China, National Science Foundation (NSF) - USA and National Research Foundation (NRF) - Korea is on 20th among the top twenties agencies. In the publication of the entire document National Natural Science Foundation (NNSF) - China has published maximum (2071) followed by National Institutes of Health (NIH) - USA (962), National Science Foundation (NSF) - USA (878) and Defense Threat Reduction Agency.

Table 1: Web of Science Documents

WEB OF SCIENCE DOCUMENTS						
Rank	**Name of Funding Agency**	**Total WoS Docs**	**OA Docs**	**Closed Access Docs**	**% of OA Docs**	**% of Closed Docs**
1	National Institutes of Health (NIH) – USA	962	807	155	83.89	16.11
2	National Natural Science Foundation (NNSF) – China	2071	146	1925	7.05	92.95

3	National Science Foundation (NSF) – USA	878	209	669	23.80	76.20
4	NIH National Library of Medicine (NLM) –USA	328	298	30	90.85	9.15
5	European Union (EU)	419	95	324	22.67	77.33
6	Social Sciences and Humanities Research Council of Canada (SSHRC)	252	42	210	16.67	83.33
7	Hong Kong Research Grants Council	132	8	124	6.06	93.94
8	Agency for Healthcare Research & Quality (AHRQ) – USA	195	182	13	93.33	6.67
9	Spanish Government	259	54	205	20.85	79.15
10	Natural Sciences and Engineering Research Council of Canada (NSERC)	131	17	114	12.98	87.02
11	National Science Council of Taiwan	300	10	290	3.33	96.67
12	Fundamental Research Funds for the Central Universities –China	268	15	253	5.60	94.40
13	Australian Research Council	195	54	141	27.69	72.31
14	NIH National Center for Research Resources (NCRR) –USA	59	57	2	96.61	3.39
15	NIH National Cancer Institute (NCI) – USA	135	112	23	82.96	17.04
16	Canadian Institutes of Health Research (CIHR)	104	51	53	49.04	50.96
17	NIH National Human Genome Research Institute (NHGRI) –USA	45	42	3	93.33	6.67
18	NIH National Institute of General Medical Sciences (NIGMS) – USA	48	44	4	91.67	8.33
19	Defense Threat Reduction Agency – USA	7	4	3	57.14	42.86
20	National Research Foundation (NRF) – Korea	133	9	124	6.77	93.23

Table 1 shows the productivity of the research funding agency in terms of published papers in open access and closed access. Under the category open access, the National Institutes of Health (NIH) - USA has published

maximum documents (807) followed by NIH National Library of Medicine (NLM) -USA (298), National Science Foundation (NSF) - USA (209) and Defense Threat Reduction Agency (4) in the last twenty years. Closed access publications mostly done by the researchers got funds from the National Science Council of Taiwan (96.67%) followed by Fundamental Research Funds for the Central Universities, China (94.40%), and National Natural Science Foundation (NNSF), Korea with 93.23% of documents. Many funding agencies in the USA and Europe provide research fund with term to publish in open access. That's why, under open publishing, the USA is dominating.

Impact of the publication:

The impact is a marked effect or influence; we can identify the quality of anything through their Impact or influence. The below table no 2, describes the impact of the publications supported by the top twenty funding agencies globally from 1999 to 2019. The Publications supported by the National Institutes of Health (NIH) - USA received the highest citations with 19539 followed by the publications supported by the National Natural Science Foundation (NNSF) - China with 18880 citations, National Science Foundation (NSF) - USA with 17617 citations and National Research Foundation of Korea 1487 citations.

The Percentage of documents cited column describes the percentage of documents that have received at least one citation. The publications supported by the Defence Threat Reduction Agency – USA gets 100% documents citations, followed by Agency for Healthcare Research & Quality (AHRQ) – the USA with 97.95% documents, NIH National Center for Research Resources (NCRR) – USA with 94.92% documents and National Natural Science Foundation (NNSF) – China gets the lowest 75.13% documents citations.

A percentile is a value on a scale of one hundred that indicates the per cent of distribution. According to average percentile, National Science Council of Taiwan is on the highest position with 53.47% followed by National Natural Science Foundation (NNSF) – China with 43.35%, Australian Research Council with 39.82% and NIH National Human Genome Research Institute (NHGRI) – USA is the lowest position with 19.66 percentile. Citation Impact shows the average number of citations that a document has received. The papers published funded by the Defense Threat Reduction Agency – USA has got maximum citation impact 220.57 followed by Hong Kong Research Grants Council 39.55, NIH National Human Genome Research Institute (NHGRI) –USA 37.42 and National Natural Science Foundation (NNSF) – China got the lowest citation impact with 9.12.

Table 2: Impact of the publications

Impact							
Rank	**Name**	**Times Cited**	**% of Docs Cited**	**Average Percentile**	**Citation Impact**	**H-Index**	**Impact Relative to World**
1	National Institutes of Health (NIH) – USA	19539	91.06	28.65	20.31	61	3.89
2	National Natural Science Foundation (NNSF) – China	18880	75.13	43.35	9.12	53	1.75
3	National Science Foundation (NSF) – USA	17617	83.14	35.22	20.06	59	3.84
4	NIH National Library of Medicine (NLM) – USA	8248	94.21	26.26	25.15	42	4.82
5	European Union (EU)	6746	81.62	38.95	16.10	35	3.08
6	Social Sciences and Humanities Research Council of Canada (SSHRC)	6046	90.08	29.95	23.99	41	4.60
7	Hong Kong Research Grants Council	5221	83.33	31.19	39.55	32	7.58
8	Agency for Healthcare Research & Quality (AHRQ) - USA	4962	97.95	20.44	25.45	38	4.87
9	Spanish Government	3282	86.87	37.62	12.67	30	2.43
10	Natural Sciences and Engineering Research Council of Canada (NSERC)	2981	85.5	37.45	22.76	22	4.36
11	National Science Council of Taiwan	2811	76	53.47	9.37	27	1.79
12	Fundamental Research Funds for the Central Universities - China	2257	79.85	42.86	8.42	22	1.61
13	Australian Research Council	2172	81.54	39.82	11.14	22	2.13
14	NIH National Center for Research Resources (NCRR) - USA	1977	94.92	23.76	33.51	24	6.42
15	NIH National Cancer Institute (NCI) – USA	1824	90.37	30.17	13.51	22	2.59
16	Canadian Institutes of Health Research	1706	93.27	26.19	16.40	23	3.14

	(CIHR)						
17	NIH National Human Genome Research Institute (NHGRI) -USA	1684	93.33	19.66	37.42	22	7.17
18	NIH National Institute of General Medical Sciences (NIGMS) - USA	1594	89.58	21.19	33.21	23	6.36
19	Defense Threat Reduction Agency – USA	1544	100	34.93	220.57	5	42.25
20	National Research Foundation of Korea	1487	81.95	37.13	11.18	22	2.14

The *h*-index role is to calculate the both productivity of research scholars and citation impat of the research publications of scitific community or research scholars, as a team of experts scientisti's as like division or sections or organization or university or country. The foundation of h-index is set of scientist's most refered research papers and the number of citations they have received for their research articles/papers in other publications. The publications funded by the National Institutes of Health (NIH) – USA has the maximum h-index with 61 followed by the National Science Foundation (NSF) – USA with 59, National Natural Science Foundation (NNSF) – China with 53 and Defense Threat Reduction Agency – USA is the lowest with h-index 5.

The indicator "Impact Relative to World" is often implimented mostly international, national, organizational level. It shows the Impact of the scholarly study in relevance to the Impact of worldwide research. It is also an indicator of Impact relative to worldwide surpass one. The global average is usually up to one. If the numerical price of the Impact Relative to World exceeds one, then the assessed entity is playing on top of the planet average. If it's but one, then it's playing below the planet average (http://help.prod-incites.com/inCites2Live/indicatorsGroup/aboutHandbook/usingCitationIndicatorsWisely/impactRelativeToWorld/referrers.html)[16]. The publications supported by the Defence Threat Reduction Agency – USA is on the highest position in Impact Relative to World with 42.45 followed by Hong Kong Research Grants Council with 7.58, NIH National Human Genome Research Institute (NHGRI) –the USA with 7.17 and Fundamental Research Funds for the Central Universities – China is on the lowest position with 1.61 impacts relative to the world.

The productivity of the publications

The Journal Impact Factor quartile is the quotient of a journal's rank in category (X) and the total number of journals in the category (Y), so that (X / Y) = Percentile Rank Z. (Q1: 0.0 < Z ≤ 0.25, Q2: 0.25 < Z ≤ 0.5, Q3: 0.5 <

Z ≤ 0.75 & Q4: 0.75 < Z.). The National Natural Science Foundation (NNSF) – China-funded articles published maximum in Q1 & Q2 journals (1020 & 386 respectable) followed by National Institutes of Health (NIH) – USA (Q1 – 760 & Q2 – 154), National Science Foundation (NSF) – USA (Q1 – 450 & Q2 – 121) documents and Defense Threat Reduction Agency – USA is published only six documents in Q1 journals; whereas no publication in Q2 journals. The % Documents in the Top 10% indicators is the top ten per cent most cited documents. National Natural Science Foundation (NNSF) – China published maximum documents in top 10% journals with 401 documents followed by National Institutes of Health (NIH) – the USA with 270 documents, National Science Foundation (NSF) – USA 242 documents and Defense Threat Reduction Agency – USA published only one documents in top 10% journals.

Table 3: Productivity of the publications.

Productivity							
Rank	**Name**	**Docs in Q1 Journals**	**Docs in Q2 Journals**	**Docs in Top 10%**	**% Docs in Q1 Journals**	**% Docs in Q2 Journals**	**% Docs in Top 10%**
1	National Institutes of Health (NIH) – USA	760	154	270	81.63	16.54	28.07
2	National Natural Science Foundation (NNSF) – China	1020	386	401	64.6	24.45	19.36
3	National Science Foundation (NSF) – USA	450	121	242	75.63	20.34	27.56
4	NIH National Library of Medicine (NLM) – USA	298	21	94	93.13	6.56	28.66
5	European Union (EU)	179	73	98	65.09	26.55	23.39
6	Social Sciences and Humanities Research Council of Canada (SSHRC)	149	45	76	67.42	20.36	30.16
7	Hong Kong Research Grants Council	87	29	52	72.5	24.17	39.39
8	Agency for Healthcare Research & Quality (AHRQ) – USA	188	6	69	96.41	3.08	35.38
9	Spanish Government	138	58	39	65.09	27.36	15.06
10	Natural Sciences and Engineering Research	83	16	28	81.37	15.69	21.37

	Council of Canada (NSERC)						
11	National Science Council of Taiwan	97	50	28	57.4	29.59	9.33
12	Fundamental Research Funds for the Central Universities – China	133	59	42	58.08	25.76	15.67
13	Australian Research Council	99	36	41	67.35	24.49	21.03
14	NIH National Center for Research Resources (NCRR) – USA	51	2	21	92.73	3.64	35.59
15	NIH National Cancer Institute (NCI) – USA	81	53	36	60	39.26	26.67
16	Canadian Institutes of Health Research (CIHR)	63	24	31	65.63	25	29.81
17	NIH National Human Genome Research Institute (NHGRI) –USA	44	1	25	97.78	2.22	55.56
18	NIH National Institute of General Medical Sciences (NIGMS) – USA	44	2	28	93.62	4.26	58.33
19	Defense Threat Reduction Agency – USA	6	0	1	85.71	0	14.29
20	National Research Foundation of Korea	76	33	39	61.79	26.83	29.32

The above table no. 3 shows the percentage of documents in Q1 journals. The publications funded by NIH National Human Genome Research Institute (NHGRI) –USA published mostly (97.41%) in the Q1 category. Agency for Healthcare Research & Quality (AHRQ) – USA was on the second position with 96.41% documents and NIH National Institute of General Medical Sciences (NIGMS) with 93.62% documents whereas National Science Council of Taiwan is the lowest position with 57.4% documents.

As can be seen in the table no 3, in the percentage of documents in Q2 journals, NIH National Cancer Institute (NCI) – USA is the highest position with 39.26% documents followed by National Science Council of Taiwan with 26.59 % documents and Spanish Government with 27.36% documents whereas Defense Threat Reduction Agency – USA has no publication in Q2 journals. Under the category percentage of documents in top 10 % journals, NIH National Institute of General Medical Sciences (NIGMS) is the highest position with 58.33% documents followed by NIH National Human Genome Research Institute (NHGRI) –the USA with 55.56%

documents and Hong Kong Research Grants Council with 39.39% documents. In contrast, the National Science Council of Taiwan is the lowest position with 9.33% documents.

Collaboration of the authors

The below figure 1 shows the industry collaboration and international collaboration of research funded by different funding agencies. The publication that lists its organization type as "corporate" for one or more of the co-author's affiliations categorized as industry collaborative publications. The National Natural Science Foundation (NNSF) – China is the highest position in Industry collaboration with 40 documents followed by National Science Foundation (NSF) – the USA with 28 documents and National Institutes of Health (NIH) – USA with 24 documents whereas four agencies did not collaborate with industry namely Social Sciences and Humanities Research Council of Canada (SSHRC), Natural Sciences and Engineering Research Council of Canada (NSERC), Canadian Institutes of Health Research (CIHR) and Defense Threat Reduction Agency – USA.

The indicator "International Collaborations" shows the number of publications that have been found with at least two different countries among the affiliations of the co-authors. It can be applied to any level of aggregation ((author, institution, national, journal or field).

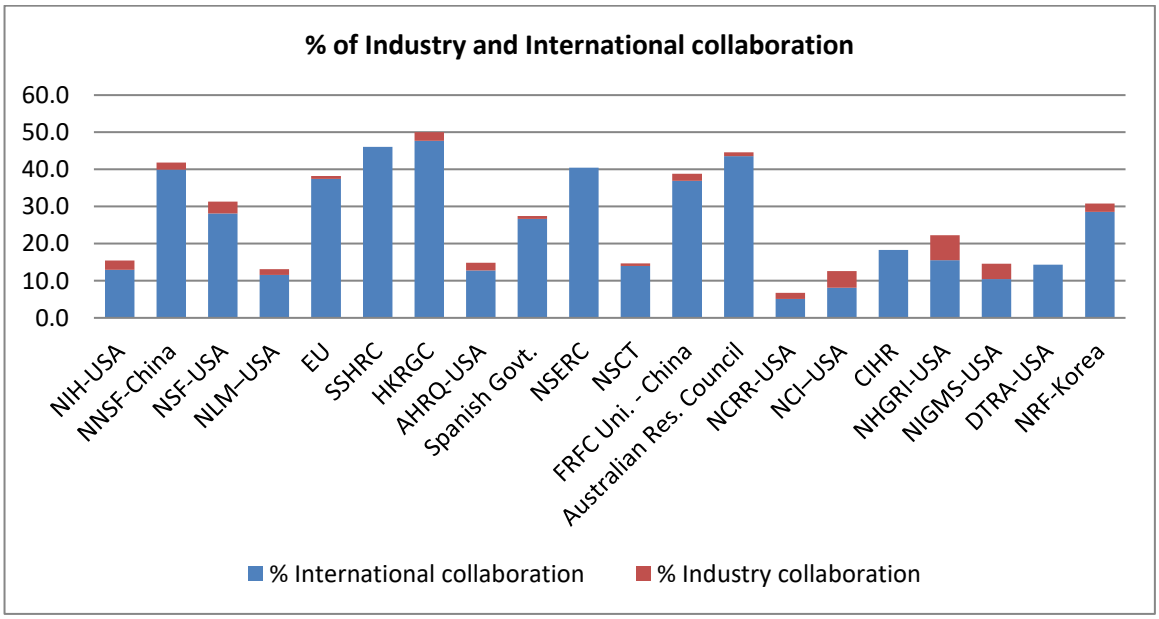

Figure 1. Collaboration of the authors

As shown in figure 1 above, the National Natural Science Foundation (NNSF) – China is the highest position in International collaboration with 827 documents followed by National Science Foundation (NSF) – the USA with 247 documents and National Institutes of Health (NIH) – the USA with 125 documents whereas Defense Threat

Reduction Agency – USA collaborate only one documents internationally. In Percentage of Industry Collaborations, NIH National Human Genome Research Institute (NHGRI) –USA is the highest position with 6.67% followed by NIH National Cancer Institute (NCI) – USA with 4.44% and NIH National Institute of General Medical Sciences (NIGMS) with 4.17% documents. Four agencies did not collaborate with the industry.

In percentage of international collaboration, Hong Kong Research Grants Council is the highest position with 47.73% followed by Social Sciences and Humanities Research Council of Canada (SSHRC) with 46.03% and Australian Research Council with 43.59% documents. The NIH National Center for Research Resources (NCRR) – USA is on the lowest position with 5.08% documents.

Result

- The top twenty agencies are studied. These top twenty agencies find out based on citation count, open and closed research publication of funded research project, publication in Q1 and Q2 journals on ranking bases in the field of Library and Information Science.
- These funding agencies are promoting and stimulating interdisciplinary research initiatives worldwide. Nine agencies are from the USA funded in Library and Information Science Research worldwide among the top twenty agencies followed by China (four agencies) and Canada (three agencies).
- High citations count indicates the value of the research article as well as the Institutions or any agencies. National Institutes of Health (NIH) – USA is on the top position among the funding agencies in citations count; that's the reason we ranked it first position globally in the field of Library and information science funding agency.
- The National Institutes of Health (NIH) - USA funded projects published maximum documents in open access journals. It indicates the support of the agency towards open research and open access initiative globally. The National Natural Science Foundation (NNSF) - China-funded projects published a maximum number of research articles in Web of Science documents. Most of the research articles published in closed access documents.
- Citation and h-index are the parameters to indicate the research article or institutions quality. The National Institutes of Health (NIH) - USA has got the maximum citations and h-index value among the top twenty funding agencies.

- The Defense Threat Reduction Agency – USA is on the highest position in Impact Relative to World. It shows the Impact of the research in relation to the Impact of global research. It is also an indicator of relative research performance.
- The Journal Impact Factor quartile is the quotient of a journal's rank. National Natural Science Foundation (NNSF) – China published maximum documents in Q1 & Q2 journals and published maximum documents in the top 10% journals.
- The National Natural Science Foundation (NNSF) – China has published maximum documents with Industry & International collaboration, whereas four agencies did not collaborate with any industry and the Defense Threat Reduction Agency – USA collaborates only 1 document with international collaboration, followed by National Human Genome Research Institute (NHGRI) –USA has a maximum (%) percentage of documents with Industry Collaborations. The Hong Kong Research Grants Council has a maximum (%) percentage of documents with international collaboration.

Conclusion

Funding agencies are excellent in research in higher education to promote and stimulate interdisciplinary research initiatives worldwide. There is a lot of opportunities in developed countries to conduct research supported by the funding agencies due to research facility available to carry out fruitful research. Developing countries face a lot of challenges due to the lack of information and research support infrastructure and facility in their nations. Particularly in the field of Library and Information science, very few opportunities are available for digitally poor counties (Undeveloped and underdeveloped) as most of the funding is available in digital emerging areas which could not take by the digitally developing nations.

However, many opportunities are there, but in the lack of information, the needy researcher misses this opportunity. In this study, we found that mostly the USA, China, and Canadian agencies are continuing funding in Library and Information Science Research worldwide. These agencies encourage scholars for more collaborative research with industry and international collaboration. The study found that Maximum agencies are supporting open research globally, and their funding output is coming in the form of publications mostly in open or free access journals compared to closed-access journals. Impact factor, Citations, h-index, and Impact on world values are high in funded research compared to general research, and maximum research papers are published in high

impact factors journals like Q1 & Q2 journals. This study will help scholars looking for a funding agency to fund their research and funding agencies to verify their Impact and productivity globally; they can also compare with other most active funding agencies.

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