

Measuring Psychology Research Output of Indian Universities

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Abstract

UGC-Infonet Digital Library consortium was formally launched in the year 2004. Through this programme, University Grants Commission (UGC) provided free access to scholarly electronic journals of internationally renowned publishers to all Indian universities who are directly coming under the preview of UGC. One of the main objectives of introducing UGC-Infonet was to improve quantity and quality of Indian scholarly literature at international level in all areas of learning. In this paper an attempt is being made to analyse the status of research output in area of Psychology. A broad evaluation is being made to assess articles produced by India and especially by those universities who have been freely accessing UGC-Infonet e-resources. The assessment is made by using Bibliometric techniques in which articles production in scholarly journals at international level and their quality through citation analysis is also being measured.

Keywords: Bibliometric study; Research output; Psychology research; UGC-Infonet

Introduction

History of psychology education was traced back in the first decade of last century. In 1905, first time psychology was considered as a subject to study under the Philosophy department of Calcutta University, West Bengal. Later in 1916, Calcutta University opened an exclusive department named 'Department of Psychology' for teaching psychology. Before independence, a formal beginning was made by opening psychology departments in some other universities like Mysore and Patna etc. Initially psychology was a subject being taught under department of Philosophy but gradually new departments for psychology were established by separating them from Department of Philosophy. Establishing different psychology departments and formation of Indian Psychology Association in 1924 to bring psychologist at one platform had also not brought expected change in the psychology education. However, just after the independence the growth of psychology education had taken a slight momentum as establishment of University Grants Commission (UGC) given various new dimensions to the psychology education as UGC started funding universities to open psychology departments. By the end of 1960s about 32 universities were having exclusive and separate departments of psychology which has reached to over 100 psychology departments by 1990s.

It was also noticed that even opening various psychology departments across the country, still Indian psychology education was completely influenced by western theories. Even to make access to western theories or articles being published in foreign journals were rarely accessible to them as tremendous price hike in subscription of scholarly journals did not allow university libraries to go for their subscription. Due to inadequate infrastructure many universities were unable to access electronic version of these journals over internet. Non availability of scholarly journals has affected quality of research work. Realizing the fact of non-availability of quality publications and availability of consortium subscription model especially for electronic journals, UGC, through UGC-Infonet programme negotiated with publishers and provided access to over 5000+ core journals in various disciplines to the universities. Since UGC bears the cost of subscription of these resources but made accessible free of cost of universities. The Information and Library Network Centre (INFLIBNET) has been entrusted with execution and monitoring of the programme. Since,

huge money has been involved in subscription of e-resources it has become more important to review outcome of the programme.

UGC-Infonet Digital Library Consortium

India has one of the largest higher education systems in the world. It has over 666 universities, 39671 colleges which accommodating over 24 million students and faculty members [1]. Libraries have been playing an important role in supporting the academic and research activities in the institutes dealing with higher learning. However, libraries around the globe have been facing problem of dwindling budget which become more critical with escalation of Journals' price. It enforced libraries to stop subscription of various important journals. The scenario was more prevalent in India almost a decade back. A study conducted by Information and Library Network Centre (INFLIBNET) in 2003 revealed that a majority of the Indian universities were subscribing to 250 journals on an average and most of them were of the Indian origin [2,3]. That means, the scholars were deprived from quality information in their respective areas. The Ministry of Human Resource and Development as well as University Grants Commission realized the importance of strengthening libraries by providing subscription of various quality international resources in all areas of learning. The UGC explored the possibility of experimenting consortia based subscription of information resources through a programme called UGC-Infonet Digital Library Consortium. The INFLIBNET Centre has been given the responsibility to execute and manage whole programme systematically. The programme operates under the direction of National Steering Committee comprises with prominent academicians of the country. The programme has enveloped universities in different phases, as per status and up-gradation of their infrastructure. The access to subscribed resources was extended to universities in phased

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manner. In the Phase I, 50 universities which were ready with required infrastructure, offered access to subscribed e-resources. In Phase-II, another set of 50 universities were offered access to e-resources in 2005. In Phase-III enveloped the universities which were getting ready with the required infrastructure to access these subscribed resources. Once universities got ready with the requisite infrastructure the access of subscribed e-resources extended to them. The UGC-Infonet Digital Library consortium is the largest academic library consortium in India monitored by INFLIBNET under the aegis of UGC. All Academic institutions, which come under the purview of UGC, are members of this consortium and in 2009; it was opened for private institutions under 'Associate Membership' option. The consortium was officially launched in 2004 after the successful trail of three months in which access to over 5000 from 16 publishers were given to 50 universities. As of now more than 196 universities and 215 other institutes and institute of national importance are accessing approximately 8932 full text journals. A series of users awareness and orientation programs were conducted in all member universities so that an optimal usage of subscribed resources can be made. Gradually, the impact of these awareness programs was reflected on usage of e-resources and research output as well.

An extensive amount has been spent on subscription of scholarly literature with the aim to bring quality in Indian research output. A vast number of quality journals being provided to Indian academicians at their desktops. It is expected that they will use the scholarly literature which was not accessible to them earlier at the same time these are getting accessed to academicians of any developed country. Now they have been expected to make quality use of these information resources and produce quality research at international level. Therefore, to evaluate broadly, an attempt is being made to understand the impact of UGC-Infonet Digital library consortium on Phase 1 universities with respect to quality and quantity of scholarly publications in the area of Psychology.

Objective of the Study

The present study keeps following objectives:

1. Number of psychology articles published in the country and by Phase -I Universities of UGC-Infonet.
2. Citations received on psychology publications
3. Impact on quality of psychology research productivity

Review of Literature

Keeping above objectives in view, various appropriate studies were reviewed so that a proper understanding can be developed in using needed metrics for assessing research output. It was found that study of psychology is extremely important to know behavior of human beings who create society and world to live. Psychology gives answers what and who human beings are, why human act and think the way they do and how someone can improve him/her-self. Pathak [4] stated that psychology has an extraordinary importance in our life. Every action of life, may it be at home, school, neighborhood or social gathering is influenced by psychology. Dalal [5] highlighted that Indian psychology has not grown much and it has largely remained as sterile academic pursuit rather playing any role in issues of national development. Kumar [6] described three broad trends of psychology, one is indigenization of psychology, second is indigenous psychology and third one is Indian psychology. The first two accommodated cultural psychological studies in which culture is the main target and source.

Whereas Indian psychology is a broad psychological aspects derived from Indian thoughts which generally influenced with philosophy and tradition of India.

Colman, Grant and Jolly [7] tried to evaluate performance of psychology departments in Great Britain with the help of articles written by each department. They analysed it by calculating average number of articles on number of faculty members in the department. Next, year a similar kind of study was again conducted by them (Colman, Grant and Henderson) [7] to analyse research performance of university departments of psychology in Britain. They evaluated the psychology publications published during 1983-1989 in seven European psychology related journals. As per number of staff and research publications produced by them were the key aspects but this time they again added funding achieved and project completed by the departments to assign ranking to them. Husian and Mushtaq [8] in their study 'Expanded (Web of Science): a scientometric study of last five years from 2005-2009' highlighted a number of parameters to evaluate an academic institution including the publication output of the institutions. They evaluated publication output patterns of Indian Central Universities and depicted the picture of the Scientometric constructs with the data collected from Science Citation Index. They also offered ranking to Indian universities as per their publications. The data about individual universities were searched for five years from 2005-2009 in the field of science and technology. A total of 12032 publications were found during the last five years, out of which the Delhi University ranked number 1, followed by Banaras Hindu University and Aligarh Muslim University at 2nd and 3rd rank. Leydesdorff [9] in his paper highlighted that the Institute of Scientific Information (ISI) maintains a Social Science Citation Index but it has lower degree of codification as compare to natural sciences. Henrekson and Waldenstrom [10] considered seven most established and commonly used measures of research performance. Out of these, three are based on journal publications, three draw on the number of citations to the researcher's most cited works and one counts raw, unadjusted output. They stated that each measure has its pros and cons. Gupta, Dhawan and Singh [11] discussed the status of social science research in India, China and Brazil during the year 1996-2007. They calculated that Indian psychological publications share was 6.47 per cent of total social science publications published by the country; China's psychology research output share was 4.14 per cent of total national research output whereas Brazil 25.74 per cent share of total national research output was in psychology. Schaffer [12] evaluated the references cited by various articles in the areas of social sciences and humanities. He analysed 156 articles in area of psychology found that a total 11279 references were cited. About 79 per cent of these citations were from Journals, 18 per cent from books and rest from other type of resources. Mukherjee [13] studied publications output of four most productive Indian academic institutions in mainstream scientific literature during 2000 -2007. He found that from 2000 to 2006, the number of published articles increased by an average of 86 per year. He also revealed that the science faculties (mostly in applied science) of these four universities are quite productive in publications (most appearing in peer-reviewed Indian journals) as compared to social sciences and arts and humanities faculty. Prathap and Gupta [14] in their study proposed a more rational procedure for ranking the research performance of universities by identifying the indicators that are best correlated with each other and then using a composite indicator emerging a product of these. By using SCOPUS, they studied 25 universities with high output of publication during a 10 year period from 1999 to 2008. Each of these universities had published more than 1200 papers during this period,

constituting 18% papers to the total cumulative research output by India. Gupta [15] evaluated research performance of 50 universities who had published highest number of research papers during 1999-2008 as per SCOPUS citation index. He ranked the performance of universities by analyzing quantity of research output (papers and share of international collaborative papers), quality (citations) and combining quantity and quality (h-index). The publication share of these universities to the total output of India showed an increase from 17.48% in 1999-03 to 18.31% in 2004-08. Arora, Trivedi and Kembhavi [16] revealed that research output of Indian universities has increased 75% in the block of 5 years (i.e., from 2005 to 2009) in comparison with previous block of 5 years. They also observed that increase in research output is significantly higher in sciences, compared to social sciences and humanities.

It was found that various studies have been done on measuring research output of countries and universities on various subjects and to give proper understanding they used various techniques in calculating or measuring research output. Google Scholar, Web of Science and Scopus are some of the citation databases being used prominently for extracting citation data. The review of literature also revealed that growth in psychology publication from India has not increased much as compare to other subject areas in sciences and social sciences.

Research Methodology

This study is based on articles published by India universities in international journals indexed by Institute of Scientific Information (ISI). The data retrieved from Social Science Citation Index and Arts & Humanities Citation Index through Web of Knowledge interface for the year 1999 to 2010. The data for India as country and Phase I universities of UGC-Infonet were extracted individually by using appropriate parameters to avoid any false entry. Science Citation Index was not used as psychology subject or aspect under medical and engineering streams was avoided.

The following three main categories of indicators were used for measuring the research output:

- Measuring productivity-the number of papers produced and growth rate of paper production.
- Intensity-the number of citations per paper and average periodic growth.
- Impact on quality-Relative Specialization Index (RSI) of Social science subjects.

Interpretations and Discussions

Production and share of research output

Table 1 shows research produced in three basic streams (Sciences, Social Sciences and Humanities) by the world, India and Phase-I universities of UGC-Infonet during 1999-2010. It also shows Indian

share of publications in total publications of the world and share of Phase-I universities in total research output of India (Table 1).

It shows that India shared 2.11% of the total research output of the world published during 1999-2010. In Sciences, India's share was 2.43% of the total research output of the world, in Social sciences India's share was only 0.49% of the total publications, whereas in humanities India contributed merely 0.11% of total humanities research output of the world. The table also shows that Phase 1 universities under UGC-Infonet consortium produced 23.71% of the total publications of the country published during 1999-2000, whereas contribution of these universities was 23.50% in sciences, 20.88% in social sciences and 42.22% in humanities.

The table further reveals that in psychology, India produced 0.30% of the total share of the world whereas Phase 1 universities under UGC-Infonet consortium covered 17.50% of the total Indian publications in psychology.

Impact on quality of psychology research output in India

Table 2, highlights the production of psychology publications by Indian academicians during 1999-2010. The duration has further been split into four segments containing a block of three years each. The table further shows that during 1999-2001, India produced 311 publications in psychology which received 3424 citations. The block counted 11.01% average citation per article, whereas received 62.06% cited rate (number of articles received atleast one or more than one citations). The H-Index of psychology publications was 30 whereas 193 articles received one or more than one citations and 118 articles did not receive any citation.

Similarly, in 2002-2004 total psychology publications were 388 which received 3838 citations with 9.89 citations per articles. Cited rate was calculated to 63.14%, which was increased to 69.75% in the year 2005-2007. The last block 2008-2010 published more number of articles and citation rate was 53.51% which is expected to be increased a due course of time. Since, articles started receiving citation after 3 years of publication (Table 2).

The table clearly indicates that growth of publications has increased over the years. There was a growth of 24.76% in publication production of the country during 2002-2004 as compared to 1999-2002. In the block period of 2005-2007, the growth was 14.18% and in the final block (2008-2010) the growth increased to 54.40% for psychology research output of the country.

Number of Psychology publications by Phase-I universities

Table 3 shows the total publications of Phase I universities in psychology. To establish better understanding the study period has been split in two blocks, i.e. 1999-2004 and 2005-2010 of UGC-Infonet Digital Library Consortium. Table depicts that the University of Delhi produced 35 and 46 (Total 81) articles in two blocks i.e. 1999-2004 and

| Subjects | World | India | UGC-Infonet Phase I Univ | % of India's share in world | % of Phase I shared of India |
|----------------|----------|--------|--------------------------|-----------------------------|------------------------------|
| All | 16996402 | 359118 | 85138 | 2.11 | 23.71 |
| Sciences | 14461012 | 352074 | 82740 | 2.43 | 23.50 |
| Social Science | 2065317 | 10203 | 2130 | 0.49 | 20.88 |
| Humanities | 1337679 | 1407 | 594 | 0.11 | 42.22 |
| Psychology | 764400 | 2303 | 403 | 0.30 | 17.50 |

Note: Multidisciplinary nature of various subjects accommodated in all related subjects.

Table 1: Share of Phase 1 universities in social science production of India and world.

| Years | Publications in SSCI | Publications | Citations | without self-citation | Citing Articles | % of Self Citation | Citing Articles without self-citation | Avg. per citation | Cited Rate (In %) | H-Index | 0 citations | 1< citations |
|-----------|----------------------|--------------|-----------|-----------------------|-----------------|--------------------|---------------------------------------|-------------------|-------------------|---------|-------------|--------------|
| 1999-2001 | Psychology | 311 | 3424 | 3391 | 3188 | 1.04 | 3163 | 11.01 | 62.06 | 30 | 118 | 193 |
| 2002-2004 | Psychology | 388 | 3838 | 3786 | 3409 | 1.53 | 3376 | 9.89 | 63.14 | 30 | 143 | 245 |
| 2005-2007 | Psychology | 443 | 3799 | 3733 | 3352 | 1.97 | 3306 | 8.58 | 69.75 | 30 | 134 | 309 |
| 2008-2010 | Psychology | 684 | 2488 | 2423 | 2216 | 2.93 | 2165 | 3.64 | 53.51 | 21 | 318 | 366 |

Table 2: Total Indian production in psychology during 1999-2010 (in block of 3 years).

| S.No. | University | 1999-2004 | 2005-2010 | 1999-2010 | | Growth Rate (block-wise) | Share of total research output | Citations Per Article |
|-------------|-------------------------------|-----------|-----------|-----------|-----------|--------------------------|--------------------------------|-----------------------|
| | | | | Article | Citations | | | |
| 1 | University of Delhi | 35 | 46 | 81 | 891 | 23.91% | 20.10% | 11.00 |
| 2 | Jawaharlal Nehru University | 11 | 14 | 25 | 1114 | 21.43% | 6.20% | 44.56 |
| 3 | Calcutta University | 10 | 8 | 18 | 233 | -25.00% | 4.47% | 12.94 |
| 4 | University of Hyderabad | 6 | 4 | 10 | 75 | -50.00% | 2.48% | 7.50 |
| 5 | Panjab University | 9 | 8 | 17 | 101 | -12.50% | 4.22% | 5.94 |
| 6 | Banaras Hindu University | 23 | 19 | 42 | 285 | -21.05% | 10.42% | 6.79 |
| 7 | Jadavpur University | 2 | 5 | 7 | 131 | 60.00% | 1.74% | 18.71 |
| 8 | University of Allahabad | 7 | 46 | 53 | 67 | 84.78% | 13.15% | 1.26 |
| 9 | Goa University | 2 | 4 | 6 | 3 | 50.00% | 1.49% | 0.50 |
| 10 | Jamia Millia Islamia | 2 | 2 | 4 | 36 | 0.00% | 0.99% | 9.00 |
| 11 | Aligarh Muslim University | 3 | 5 | 8 | 98 | 40.00% | 1.99% | 12.25 |
| 12 | Andhra University | 0 | 2 | 2 | 146 | 100.00% | 0.50% | 73.00 |
| 13 | University of Mysore | 3 | 8 | 11 | 41 | 62.50% | 2.73% | 3.73 |
| 14 | University of Mumbai | 2 | 9 | 11 | 20 | 77.78% | 2.73% | 1.82 |
| 15 | University of Pune | 9 | 3 | 12 | 14 | -200.00% | 2.98% | 1.17 |
| 16 | Guru Nanak Dev University | 3 | 2 | 5 | 16 | -50.00% | 1.24% | 3.20 |
| 17 | M S University of Baroda | 10 | 6 | 16 | 292 | -66.67% | 3.97% | 18.25 |
| 18 | University of North Bengal | 0 | 3 | 3 | 8 | 100.00% | 0.74% | 2.67 |
| 19 | University of Madras | 3 | 3 | 6 | 84 | 0.00% | 1.49% | 14.00 |
| 20 | Punjabi University | 2 | 1 | 3 | 52 | -100.00% | 0.74% | 17.33 |
| 21 | Karnatak University | 1 | 5 | 6 | 63 | 80.00% | 1.49% | 10.50 |
| 22 | University of Kerala | 1 | 4 | 5 | 46 | 75.00% | 1.24% | 9.20 |
| 23 | Birla Institute of Tech& Sc. | 0 | 9 | 9 | 41 | 100.00% | 2.23% | 4.56 |
| 24 | Anna University | 0 | 1 | 1 | 71 | 100.00% | 0.25% | 71.00 |
| 25 | Bangalore University | 4 | 0 | 4 | 125 | -100.00% | 0.99% | 31.25 |
| 26 | Kurukshetra University | 1 | 6 | 7 | 19 | 83.33% | 1.74% | 2.71 |
| 27 | North Eastern Hill Univ | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 28 | Osmania University | 5 | 4 | 9 | 85 | -25.00% | 2.23% | 9.44 |
| 29 | University of Rajasthan | 2 | 4 | 6 | 82 | 50.00% | 1.49% | 13.67 |
| 30 | Cochin Univ of Sc & Tech | 0 | 1 | 1 | 9 | 100.00% | 0.25% | 9.00 |
| 31 | Gauhati University | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 32 | Mahatma Gandhi University | 0 | 1 | 1 | 10 | 100.00% | 0.25% | 10.00 |
| 33 | Jammu University | 0 | 2 | 2 | 2 | 100.00% | 0.50% | 1.00 |
| 34 | University of Kashmir | 1 | 4 | 5 | 4 | 75.00% | 1.24% | 0.80 |
| 35 | Mangalore University | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 36 | Pondicherry University | 1 | 0 | 1 | 14 | -100.00% | 0.25% | 14.00 |
| 37 | Jamia Hamdard University | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 38 | Manipur University | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 39 | Pt. Ravishankar Shukla Univ | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 40 | Tezpur University | 0 | 0 | 0 | 0 | NA | 0.00% | 0.00 |
| 41 | Thapar Inst of Engg & Tech | 1 | 1 | 2 | 1 | 0.00% | 0.50% | 0.50 |
| 42 | University of Calicut | 0 | 0 | 0 | 0 | 0.00% | 0.00% | 0.00 |
| 43 | Jiwaji University | 0 | 0 | 0 | 0 | 0.00% | 0.00% | 0 |
| 44 | Kuvempu University | 0 | 1 | 1 | 0 | 100.00% | 0.25% | 0 |
| 45 | Madurai Kamaraj University | 1 | 0 | 1 | 8 | -100.00% | 0.25% | 8 |
| 46 | Shivaji University | 1 | 1 | 2 | 0 | 0.00% | 0.50% | 0 |
| 47 | Avinashilingam Univ for Women | 0 | 0 | 0 | 0 | NA | 0.00% | 0 |
| 48 | Nagpur University | 0 | 0 | 0 | 0 | NA | 0.00% | 0 |
| 49 | Sardar Patel University | 0 | 0 | 0 | 0 | NA | 0.00% | 0 |
| 50 | Devi Ahilya Vishwavidyalaya | 0 | 0 | 0 | 0 | NA | 0.00% | 0 |
| Grand Total | | 161 | 242 | 403 | 4287 | 33.47% | 100.00% | 10.64 |

NA= Not Assessed

Table 3: Psychology research output of Phase – 1 Universities of UGC-Infonet.

2005-2010 respectively which shows 23.91% growth in block II (2005-2010) over block I (1999-2004). University of Delhi shared 20.10% of total publications published in psychology by Phase I universities of UGC-Infonet during 1999-2010. The average citations per article come to 11.00 which signify quality research work. Similarly University of Allahabad produced second highest number of publications (53) in psychology for the same period. The growth in production of publications in this university was 84.78% in block II. It shares 13.15% part of total psychology publications produced by the Phase-I universities and achieved 1.26 citations per article rate which is quite low for any good university. It shows that high number of produced articles does not mean quality research work, whereas number of citations received by any article can signify its quality (Table 3).

The overall growth in psychology publications of Phase-I universities in 2nd block (2004-2010) is 33.47% whereas 10.64 citations per article in psychology were cumulatively received by these universities.

Annual growth of publications

The Average Annual Growth Rate (AAGR) for production of research publications before and after the introduction of UGC-Infonet was also counted. Table 4 depicts that the average annual growth rate of psychology publication was 15.80 % during 1999-2004 which increased to 18.05% during 2005-2010. That means the cumulative annual growth increased by 2.24% in Psychology. This is a moderate increase which does not give an encouraging sign with respect to increase in quantity of scholarly publications. The reasons of this moderate increase can be many which also include that, while writing, Indian psychologists are more inclined towards adopting Indian cultural theories addressing psychological problems and issues. Publishing these theories in publications of Western world may not attract relevant readers hence Indian psychologist generally publish in Indian publications which may not be indexed by International citation databases. Articles written in Indian languages are also not being included by citation databases of ISI and it is well known fact that citation databases of ISI are more inclined towards US publications (Table 4).

Annual growth of citations received

Annual growth rate for citations was also calculated. Since, citations

for articles published in block II (i.e. 2005-2010) were recorded, hence a cumulative average annual growth rate was observed. As depicted in Table 5, 59.83% average annual growth rate of citation was recorded in psychology for 12 years of study. The Annual Growth Rate for block first (1999-2004) was 103.96% was recorded as maximum number of articles, in this block 200 citations were received by 161 articles published during the period whereas in second block (2005-2010) 242 articles received 1064 citations. This increase number of citations can also be interpreted to some extent as improvement in the quality of research work. The annual growth rate of citations was calculated 20.68% during second block (i.e. 2005-2010) of the study (Table 5).

Relative Specialization Index

Relative Specialization Index (RSI) for different subjects was also measured to know whether a country or an institution has a relatively higher or lower share in publications of a particular subject in the world or in the country. The metrics of RSI is based on the Activity Index (AI).

$$\text{Activity Index (AI)} = \frac{\text{Total number of publications in a given field of the country/Institute/Segment}}{\text{Total number of publications in a given subject of the world/Country}}$$

Hence, Relative Specialization Index (RSI) is defined as: $RSI = AI-1/AI + 1$

Zero (0) count of RSI indicates a balance activity in the respective field.

As depicted in Table 6, RSI for Phase 1 universities under UGC-Infonet consortium were counted against psychology publications of the world and India produced during the year 1999-2010 in two blocks of six years each. For 1999 -2004, the contribution of these universities to the total psychology publications produced by the world was recorded to -0.9991 and to -0.6954 to India in psychology. Since, RSI to world's publications for 2005-2010 was recorded to -0.9989 and -0.7065 on Indian research output, this shows a noticeable share of the research output of Phase 1 universities under UGC-Infonet consortium to India's total publications (Table 6).

The table clearly shows that RSI of Phase I universities under UGC-Infonet when compared with the total output of India low. Whereas, share of Phase- I universities against the world psychology article production has improved. This simply indicates that the psychology publications produced by the other institutions or agencies

| Subjects | YEARS | | | | | | 1999-2004 | | | 2005-2010 | | | Overall | | | |
|------------|---------|---------|---------|---------|-------|-----------|-----------|--------|--------|-----------|--------|--------|---------|------|------|-------|
| | 1999-01 | 2002-04 | 2005-07 | 2008-10 | Total | 1999-2004 | 2005-2010 | Beg Yr | End Yr | AAGR | Beg Yr | End Yr | AAGR | 1999 | 2010 | AAGR |
| Psychology | 85 | 76 | 80 | 162 | 403 | 161 | 242 | 17 | 41 | 15.80% | 17 | 46 | 18.05% | 17 | 46 | 9.59% |

Table 4: Annual growth in psychology publications.

| Subject | YEARS | | | | | 1999-2004 | | | 2005-2010 | | | Overall | | | | |
|------------|---------|---------|---------|---------|-------|-----------|-----------|--------|-----------|---------|--------|---------|--------|------|------|--------|
| | 1999-01 | 2002-04 | 2005-07 | 2008-10 | Total | 1999-2004 | 2005-2010 | Beg Yr | End Yr | AGR | Beg Yr | End Yr | AGR | 1999 | 2010 | AGR |
| Psychology | 27 | 173 | 342 | 722 | 1264 | 200 | 1064 | 1 | 72 | 103.96% | 90 | 278 | 20.68% | 1 | 278 | 59.83% |

Table 5: Annual growth in number of citations received.

| Subject | 1999-2004 | | | | | Relative specialization Index to World | Relative specialization Index to India |
|-------------|-----------|-------|-------------|--|--|--|--|
| | World | India | UGC-Infonet | Relative specialization Index to World | Relative specialization Index to India | | |
| 1999 - 2004 | 343693 | 896 | 161 | -0.9991 | -0.6954 | | |
| 2005 -2010 | 420707 | 1407 | 242 | -0.9989 | -0.7065 | | |

Note: Multidisciplinary nature of various subjects accommodated in all related subjects.

Table 6: RSI of Phase-I Universities in comparison with total psychology research output of World and India.

in India are doing more research in the area of psychology than the Phase-I universities. A huge amount is being invested in some of the institutions/agencies such as medical institutions, psychological clinics for doing research under clinical psychology, abnormal psychology and in other medical aspects of psychology, which generally publish their research outputs at International levels more frequent than the psychologists working in universities.

Conclusion

Earlier Indian psychology was emphasizing on using theories of western psychology but now psychology experts have started focusing on psycho-cultural contexts. Now, Indian psychologies have released the gaps and instead of concentrating on replicating western theories in India they started working on Indian psychological models. With respect to psychology publications while comparing both blocks of studied period i.e. 1999-2004 and 2005-2010 the annual growth of article production has not improved much whereas citation per article has gone higher. That means the quantity of article production has not increased much but quality has been improved significantly. Although, tremendous amount of literature is being made freely available to Indian universities from across the world but psychology literature published within the country are not accessible to them through UGC-Infonet programme. Therefore, authority of UGC-Infonet consortium should also think by subscribing Indian literature and making it accessible to Indian universities. However, Indian publishers should also think of publishing Indian psychology journals in electronic form as well as a few journals are there in electronic format. INFLIBNET should initiate few studies to evaluate impact of UGC-Infonet consortium on research output of the country in different subject areas so that proper measures can be done in subscription of relevant resources and in extending consortium benefit to the members who really make constructive use of this ambitious privilege.

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