Chapter 5
Findings, Conclusions and Suggestions

This chapter is divided into three sections: the findings of the study; the conclusions made from the findings and the researcher’s suggestions for improving the research productivity in the universities of India.

5.1 Findings

- A total of 82 Faculty Members and 11 Departments are covered in the study. Out of the total 82 Faculty Members 12 (14%) are Females and rest 70 (84%) are Male Faculty Members. This difference shows gender disparity.

- Out of the total 82 Faculty Members, 34 (41%) Faculty Members are Professors, 20 (24%) are Associate Professors and 28 (34%) are Assistant Professors.

- Out of the 14 Departments approved by the universities 3 Departments are not operational.

- By year of establishment BHU is the oldest Department started in 1950 and the Department of Central University of Rajasthan was recently started in 2009.

- Out of the 14 Departments all the 11 Departments conduct PG courses, Ph.D Programmes are conducted by all Departments except the Departments of IGNOU and University of Rajasthan. The 2 Departments of Pondicherry University and NEHU conduct the PG Diploma in Statistical Methods.

- Out of the 11 Departments 6 Departments of Delhi University, AMU, GU,PU,HU and BHU had worked and completed research projects in the period 2000-10. It is found that only 32 out of 82 Faculty Members mentioned that they have worked in a Project and each Project ended with publishing a Journal article.

- The Faculty Members are specialized in the following areas of the discipline statistics are

  1. Statistical Inference

  2. Demography

  3. Sampling

  4. Reliability Theory

  5. Bayesian Applications

  6. Stochastic Process
7). Operation Research

8). Differential Equations

- Out of 82 Faculty Members, 75 Faculty Members have Ph.D as their highest qualification.
- It is found that out of 597 publications 51% (304) of the publications are published by three authors, 22% (131) of the publications are published by four and more authors, 20% (119) of the publications are published by single author and rest 7% (43) of the publications are published by joint authors. It must be mentioned that during the study it was found only Faculty Members of Hyderabad University have the pattern of publishing single.
- Regarding the research output i.e the publications by the 11 Departments. Journal articles, Books and Conference Proceedings are the main research output of the Faculty Members.
- There are 597 publications by all the Departments in the period 2000-10.
- Journal articles mostly published, as 529 (88%) of the total publications are the Journal articles.
- After Journal Articles, Conference Papers are published and 42 papers were published in 2000-2010. As Mathematical and Statistical science in Natural science are not influenced much by technology so the upcoming research areas are less.
- Regarding books 26 books were published in the period and it is found that books are published by the senior Faculty Members.
- On an average each Faculty member publishes 7 publications in a 10 year period.
- Average publications of each Department are the total publications divided by the Faculty size of the respective Departments.
- AMU has the highest number of Total publications followed by BHU and DU.
- It is found that out of 529 Journal articles, published by the Faculty Members in 200-2010. The number of articles at International journals are 301 (57%) and the number of journal articles at national level is 296 (43%). Out of the 42 conference papers published by the Faculty Members in 2000-2010, 12 papers are presented in International level conferences and rest 30 papers are presented at National/Regional level.
- In case of Avg. Publications we can see that DU has the highest publications followed by AMU and BHU.
- The referred research output i.e the publications of Faculty Members cited by any of the two citation database.
- We find that a total of 186 (31%) out of 597 publications were cited by WS and MSN.
- On an average each Faculty member has 2 citations in a 10 year period.
The publications are more cited by MSN (76%) as compared to WS (24%). It is clear that WS only includes highest impact peer reviewed journals in their database and has less coverage of preprints, journals, books, etc.

There is a positive correlation between Faculty Size and Number of Publications.

There is a growth of publications in the succeeding years estimated through the method of Least Square

Average referred publications of each Department are the Total referred publications divided by the Faculty size of the respective Departments.

In case of Avg. Referred publications we can see that DU has the highest referred publications followed by AU and HU.

The research productivity is calculated from the Avg. Total Publications and Avg. Total Referred Publications.

With regard to research productivity the Department of DU is First, Second is the Department of BHU and Third is the Department of AU.

Thus on the basis of total publications and referred publications we can conclude that Delhi University has the highest research productivity followed by Banaras Hindu University and Allahabad University respectively in Statistics discipline in the period 2000-2010.

And the annual publication rate is growing by 11% and the annual publication rate of expected number of publications is growing at the rate 10%.

5.2 Suggestions

The research productivity of the Faculty Members are not at par with other developed countries. The research productivity of Indian universities is low and so none of the Indian universities are in the top 300 world University rankings and it is highly recommended that Authorities must note the problems and try to solve them.

On the basis of discussion with the Faculty Members and literature studied about the low research productivity the related suggestions can be grouped into 3 sections given below

5.2.1 Faculty related Suggestions

1. The research facilities should be developed for improving research productivity such as having a well equipped Laboratory, Language laboratories, Libraries and archival collections.
2. Faculty Members with high performance and output in research should be given reimbursement of travel, accommodation and other related expenses on duty.
3. The pressure from all academic and non-academic has to be reduced by the recruitment of Research Associates, Teaching Assistants and Post-doctoral Fellows for universities. The supporting staffs are also required to do the other non academic jobs.
4. The Faculty Members should be given royalty income from the technology transfer, software
development and consultancy provided to the government or private sector.

5. For the Faculty promotions the criteria should be set like the number of research publications, impact
factor of journals, citations.

5.2.2 Department related Suggestions

1. The Departments should link their teaching and research initiatives with manpower training program,
innovation and community service.

2. The post-graduate and doctoral students must go through a detailed course on how to conduct research
ethically by promoting original thinking, analysis and writing. The course should also review all the cases of
scientific misconduct that have occurred over the last few decades to understand the associated problems in
research.

3. Continuously updating the syllabus with periodic revision to make the teaching and learning fascinating
for the teachers, students and at the same time trying to meet the local, state and national needs.

4. Students should be encouraged for original writing and analysis. Awards should be given for student for
publishing in quality journal articles, book chapters etc.

5. Research funds not only from the University Grants Commission but from other funding agencies also
should be extended to the Departments.

6. The leading Departments in specialized discipline should become networking centers in different parts of
the country to promote collaborative research, access to advanced facilities and training in frontier areas.

7. Strong linkage between the Universities and Research laboratories of CSIR DRDO, Indian Statistical
Institutes etc should be built up and promoted through joint research projects and training.

8. Setting up of Internal Quality Assessment Cell to assess the performance of the institution.

5.2.3 Government related Suggestions

1. To enhance the quality of teaching, learning and research the higher education Institutions offering
postgraduate and research programmes should be identified and encouraged with research grants, internet
and digital resources. Postgraduate and research Departments should be encouraged to do more research and
their workload should be considerably reduced.

2. Priority should be taken for the maximum access to research journals.

3. To reduce the workload on Faculty Members the recruitment of Research Associates, Teaching
Assistants and Post-doctoral Fellows for universities should be done without any delay.

4. There are a large number of vacant sanctioned Faculty positions in universities which needs to be filled
transparently.
5. The number of PhDs from Indian Universities should be increased with proper standards.

6. Encouragement should be given to interdisciplinary movement between Science & Technology streams and industrial R&D.

5.3 Conclusions

It is found that the publications of the faculty members is increasing over the years. The various facets of publication pattern are found and analysed in the study. Collaboration by two or more authors is growing, journal articles are the main source of communication, the articles that are published in journals are in international in scope, the number of referred articles cited by major database is also growing. Research productivity is calculated on the basis of total publications and referred publications in relation to faculty size of the respective departments. There are demographic factors and institutional factors such as age, gender, and marital status that hindrance low research output. During the study it is found that demographic factors have only a slight affect on research productivity because the respondents said that the outcomes depend on the enthusiasm and willingness of Faculty Members rather than the barriers of age, gender or marital status.

Governments expect universities to become more competent and successful in teaching and research. Academic staff in universities are developing their research performance as new knowledge is generated and that place the basis for academic support. Research productivity in Universities has become a most important criterion for making promotion and tenure decisions. There is clear evidence that administrators at many Institutions together with the academic staff realize the important of research within the University structure. Many barriers to research productivity which require resolution and abolition must be eliminated in order that Faculty Members can increase their research output. In India many academicians lack the knowledge, skills, experience and resources to do research. The academic staffs face the problems of teaching work load, lack of research facilities and complicated financial regulation/policies.

Planning Commission (2009) The report strongly recommended that the base of sciences in the University needs to be rebuilt and strengthened by taking newer initiatives in the frontier areas. The Committee is of the view that utility of social sciences to our society, polity, economy, etc. cannot be overlooked as they add value to one’s life. The Committee is of the opinion that this imbalance needs to be corrected immediately by making the study of Social Sciences scientific, interesting and relevant to present situation. The resource funding allocation in the case of university is not effective and some faculties have a lower level of supporting facilities than they request. In this context the science faculties needs special care for research funding allocation.

The various suggestions found during the study must be taken by the faculties, administrators and government, priority wise, to improve the research productivity of universities in India.