

30
RESEARCH QUALITY IN INDIAN HIGHER EDUCATION SYSTEM - CURRENT SCENARIO**S. Iruthaya Kalaiselvam and S. Catherine P. Alexander**

Post Graduate and Research Center of Zoology

Jayaraj Annapackiam College for Women (Autonomous), Periyakulam-625601, India

E-mail: Catherine_ruskin@yahoo.co.in

Abstract

Research is an extremely important part of education system particularly in higher education institutions. When we talk about research in higher education institutions we just count the number of papers which is absolutely meaningless, we have to focus on the quality of research. Quality research, typically emphasize the traits of objectivity, internal validity, external validity, reliability, rigor, open-mindedness, honest and thorough reporting. It is undoubtedly true that finding quality research in Indian higher education institutions is something like a mirage. It's a well established fact that India is going downhill in quality of research, despite of relative huge increase in funding and being the major technical manpower supplier for IT and global research community. Most of the research conducted or conducting in our higher education institutions is repetitiousness and outdated one though there is a dire need for conducting research on emerging issues that are crying hoarse to be solved for the growth and development of society. This is mainly due to lack of uniqueness in topic selection, unaware of advanced tools and techniques for solving emerging issues, and non-availability of competent guides who are adept in using robust research methodologies that are severally hampering the quality of research. There is a great mismatch between input and output from professors in Indian higher education institutions. The society expects Indian researchers to contribute to global knowledge to solve global challenges and create a web of inter-connectedness together to achieve more.

Keywords: Research, Quality, higher education institutions, Research misconduct**1. Introduction**

Research is an extremely important part of education system particularly in higher education institutions. It is the systemic study of trend or event with careful collection, presentation, analysis and interpretation of quantitative data or facts that relates human's thinking with reality [1]. Research has to be divided into basic research, applied research and developmental research. Basic research is used to discover the basic truths or Principles, applied research which involves seeking new applications of scientific knowledge to the solution of a problem and developmental research should be decision oriented research which involves the application of the steps of the scientific method. Research in higher education institutions should be focus on the quality of research.

The academic world urgently needs a critical discussion on what is meant by 'good' research. While there is no single yardstick for assessing research quality across all disciplines, regions and cultures, this does not make the question of quality irrelevant. On the contrary, the issue concerning appropriate criteria for assessing the quality of research should be on the agenda wherever it is being conducted. Many a factor critically affect the quality of research, (i) Research facilities and infrastructure, (ii) Peer presence and work culture of the place, (iii) Nature of regulatory systems and quality of administration, (iv) Power of extra-academic influences [2].

2. Quality research and Quality evidence

First of all, quality research shouldn't be confused with quality evidence, because the sum of quality research results, on a specific topic, defines the quality of the evidence. The terms quality research and quality evidence are related concepts that have been at the center of much debate in academic, professional, and public policy circles. While research quality pertains to the scientific process, evidence quality pertains more to a judgment regarding the strength and confidence one has in the research findings emanating from the scientific process [3]. Quality scientific research is understood as a process (checklist), comprising several steps, that attempts to ensure the credibility,

applicability, consistency and neutrality of the results. The checklist defines a standard, which is agreed by experts, and may vary depending on whether one is using a quantitative or qualitative approach. In the case of quantitative research the criteria to assess its quality includes: the internal validity of the results (context, sample size, power calculation), external validity (ecological generalizability, verified predicted relationships, etc.), reliability (consistency if replicated), replicability (can others reproduce the results?), and objectivity (unbiased).

3. Threats to a Research's validity

A valid study answers research questions in a scientifically rigorous manner. Threats to a study's validity are found in three areas [5]:

3.1. Internal Validity

To determine whether a research study has internal validity, a research consumer should ask whether changes in the outcome could be attributed to alternative explanations, which are not explored in the study. For example, a study may show that a new curriculum preceded a significant increase in children's reading comprehension. The study must rule out alternative explanations for the increase in reading comprehension, such as a new teacher, in order to attribute the increase in reading comprehension to the new curriculum. Studies that specifically explain how alternative explanations were ruled out are more likely to have internal validity.

3.2. External Validity

To assess whether a study has external validity, a research consumer should ask whether the findings apply to individual's work place, times, and circumstances differ from those of study participants. A study's external validity is closely related to the generalizability of the findings. For example, a research study shows that a new curriculum improved reading comprehension of third-grade children in Delhi. As a research consumer, you want to ask whether this new curriculum may also be effective with third graders in Chennai or with children in other elementary grades. Studies that randomly select participants

from the most diverse and representative populations are more likely to have external validity.

3.3 Construct Validity

To assess whether a study has construct validity, a research consumer should ask whether the study has adequately measured the key concepts in the study. For example, a study of reading comprehension should present convincing evidence that reading tests do indeed measure reading comprehension. Studies that use measures that have been independently validated in prior studies are more likely to have construct validity.

4. Research misconduct

Research misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results [1].

4.1. Falsification

Falsification indicates alterations or intended misinterpretation of the true evidence of experimental or observational studies. Falsification is in a continuum state with the process of data selection, the latter implying declared and defensible criteria based on the aims of a given research and the statistical methods identified to test main and secondary hypothesis as stated in the written research protocol [1].

4.2. Fabrication

Data fabrication means making up data or other relevant information at any stage of the typical scientific process spanning from research development and application for funding, up to the submission of findings for publication [1].

4.3. Plagiarism

Intentionally using other people's thoughts, ideas, or words is considered plagiarism. It is a violation of the ethical principle of failing to reveal and crediting an existing source by proposing as one's own idea when it truly belongs

to someone else. It is a matter of false attribution. Self-plagiarism is also considered ethically unacceptable: it occurs when one uses his own previously published work (or parts of it) without citing any source. Self-plagiarism rather than being strictly an issue of false attribution is generally a way of increasing someone's scientific production by attempting to repeatedly publish copies of one's own research findings or papers in different scientific journals. Although scientific journals' publication policy requires that a paper can be submitted for publication to a single journal [1].

Plagiarism examples:

- Investigators, during the peer- review process, taking ideas from others' grant proposals or articles and including them in their own publications.
- Students taking material from the internet verbatim, without attribution, during write-ups of research or other scholarly work.
- Faculty taking dissertation material from students and including it in publications without giving due credit.

Research misconduct does not include accidental error or honest misinterpretation of results.

5. Two aspects to integrity in research

For research to proceed efficiently, two aspects of scientific integrity need to be fostered. First, there is the integrity of the scientific literature, which can accumulate errors due to inadvertent mistakes as well as due to deliberate falsification or fabrication of data, i.e. research misconduct. Secondly, there is the integrity of the scientists themselves, who need to act honestly both in how they generate and report data, as well as in how they adhere to ethical regulations, and how fairly they allocate credit [6]. Researchers also must act honestly when conducting peer review of papers and grant applications.

6. Preventing Research Misconduct

Researchers share public concerns for the prevention of research misconduct because advances in and public support of research depend on the reliability of

the research record. Sustained public trust in the research enterprise requires confidence in the research record and the processes involved in its ongoing development. Occurrence of research misconduct has serious consequences for all involved – respondents, co-workers, complainants, institutions, sponsors, patients, and journals [7].

4.1. Suggestions for preventing and identifying research misconduct

- The P.I., Lab director, etc. must establish a climate in the lab in which scientific integrity (and the reasons for it) are emphasized
- All staff must be thoroughly trained in integrity principles and in conducting their portion of the protocol
- The P.I. and other supervisors must maintain strong communication with staff and a "presence" in the study setting, verifying personally at least a sampling of the research records
- Staff should be questioned about data alterations in the research record (overwrites, erasures, whiteouts, changes in electronic records)
- If possible, request informed consent permission to re-contact the patient for quality control reasons, and follow up with a sampling of these patients
- Keep staff workloads reasonable
- Protocols should be designed with realistic requirements that can be met by both staff and patients
- Data forms should be as simple as possible, yet with clear designation of the required information
- In on-going studies, if possible, train more than one staff member to do follow-up.
- Any alterations on data forms must be done by striking through the original entry (no whiteout or writing over) and initialing and dating the new entry

7. Research in India

India is not yet a major player in world science. Its publications generate fewer citations on average than do those of other science-focused nations, including other emerging countries such as Brazil and China [5]. Relative to its

size, India has very few scientists; many Indian-born researchers leave for positions abroad and very few foreign scientists settle in India. The country invests a scant portion of its economy in research and development (R&D), and it produces relatively few patents per capita compared with other nations. India's 700 or so universities vary tremendously in quality.

8. Quality of research in India

The quality of research in Indian universities may appear to be an esoteric subject and remote from more pressing concerns of existence and survival for the people. The major problem that Indian education system is facing is of good researcher. Quality of research depends upon the quality of scholar and supervisor and India has been trying to attract quality teachers but unfortunately government of India has not been able to do in spite of increasing the salary and giving other benefits people are not opting teaching profession. There are a number of issues plaguing the research in higher education system in India [1]. There is a lot of political interference, resource crunch with the state universities. Students are unwilling to take up social sciences and humanities stream as they do not have any option. There is no question that the academic health of life science departments in most universities in India is not in a good shape as reflected by the general lack of enthusiasm and passion for teaching/learning or research in the faculty as well as the students. The multiple vicious circles that have entangled the education system in the country need to be understood and resolved sooner than later.

9. Impact of research misconduct on Growing number of retractions

A bell-weather of the problems in academic publishing has been the growing number of retractions. Journals can correct errors in the literature, and alert their readers to problems in published papers, in three ways: they can publish a correction, an editorial note of concern, or they can retract the paper, either with or without the authors' consent [8]. The number of papers that are retracted can give an indication of the amount of misconduct, but it is only a very crude measure, both because some papers are retracted due to innocent mistakes,

and because authors, journals, and institutions are reluctant to publish retractions because they feel it damages their reputations. The number of retracted scientific articles has been increasing. Most retractions are associated with research misconduct, entailing financial costs to funding sources and damage to the careers of those committing misconduct.

The result of research misconduct is the damaging consequences to the careers and reputations of those found to have committed misconduct. A recent report demonstrated a significant decline in the citation of an author's work after one of his or her papers was retracted. However, the degree to which retraction of an author's paper affects his or her own subsequent research productivity has not been quantified.

10. Indian scientist in the news for wrong reasons

The unethical behavior of an Indian scientist has led to the retraction of a highly cited paper published on July 19, 2013 in the journal "Science". "Inappropriate data handling" by Rabindra N. Mahato, the first author of the paper ("Ultrahigh magneto resistance at room temperature in molecular wires") has led to its retraction. The paper was about manipulating the current in a string of molecules with a magnet.

According to Retraction Watch, the paper has been cited 41 times since it was published in 2013, earning it a designation of "highly cited" from Thomson Scientific's Web of Knowledge. When suspicion arose with regard to data collected by Dr. Mahato when some of the co-authors tried to undertake follow-up research, they had difficulties reproducing the results of Dr. Mahato in their own lab, Van der Wiel told Retraction Watch. And this, in turn, led to a thorough investigation by the co-authors [9].

11. Role of Academic and research institutions

There is no doubt that academic and research institutions have a big role to play in discouraging scientific misconduct. Institutions should be encouraged to explore the state of research misconduct in their own environments and formulate guidelines for investigating and dealing with suspected cases of

scientific misconduct. It might further be appropriate to consider the role of a national body that could coordinate institutional efforts and make resources available to institutions that lack the academic and human resources needed for such an endeavor [10].

There is no single formula for improving research in universities; it comes from different elements like who will do the research, research has to be divided into basic research and applied research. India has certain number of institutes for doing basic research and government is providing funds to them. While in case of applied research there has to be inter-university collaboration as there are some universities which have good scientists' better instruments while certain other institutes lacks in these resources [11]. Research has to be a continuous process and it is beyond the classroom teaching and learning. There needs to be an active interaction between supervisor and researcher then only it can be meaningful research. Interest of scholars is another aspect of gainful research work although guides can help them but it cannot be enforced [12].

12. Summary

Although it remains true that science is ultimately self-correcting, society as a whole will benefit more, and progress will be more rapid, if research is conducted efficiently. To do so requires minimising the number of errors that enter the literature, and quickly correcting those that inevitably do. Research will also be performed more efficiently if those who conduct it are fair and honest. However, as a human endeavour, science must be managed actively for its integrity to be upheld [13]. This requires not only a bottom-up, "grass roots" effort based on principles of honesty and fairness, it also requires some top-down mechanisms to ensure compliance. There must be mechanisms in place so that errors and concerns of possible misconduct can be reported. Publishers should try to minimize entry of errors into the literature by screening manuscripts and using unbiased peer review, and should cooperate with institutions when problems arise. Nations and national scientific academies should provide mechanisms to offer advice and oversight for research institutions. Researchers

need to have integrity in how they conduct themselves, and whether it is through official channels or anonymously via the web, when they see errors or have concerns about possible misconduct, they should, after seeking advice, speak up [11].

Research in Indian universities can only be improved with the help of society. Society participation will help universities choose research areas that will benefit society and industry at large. The central government and University Grants Commission should consider each and every aspect while granting funds for research and development. The funding should be increased to boost the morale of the researchers as well as the university [1]. The UGC has to formulate strict laws that will curb money making institutions to mushroom. The quality of research can be improved if the research is more realistic and oriented to towards the need of the society. It is also a gigantic task to provide quality research to everyone. There is a great mismatch between input (i.e. experience, work load, salary and perquisites, power & authority come with designation, etc.) and output (i.e. patents, trademarks, quality research published in scholarly journals) from professors in Indian higher education institutions. A well managed and progressive education system rests on the work of able researchers and their vision. Unfortunately, Indian education system lacks good researchers and opportunities. Bright scholars and researchers require motivation and right attitude to carry on their work. The society expects Indian researchers to contribute to global knowledge to solve global challenges and create a web of inter-connectedness together to achieve more.

13. References

1. Avinash Patil and Subrata Biswas (2014) Opportunities and Challenges for Sustainable R&D in India International Journal of Research and Development - A Management Review (IJRDMR) ISSN (Print): 2319-5479, Volume-3, Issue-1.
2. Bourgeois, E. (2002) Higher Education and Research for the ERA: current trends and challenges for the future. Luxembourg: Office for Official Publications of the European Communities.
3. European Research Advisory Board (2002) Some Issues Affecting the Future of University Research in the EU. EURAB.

4. Kyvik, S. & T.B. Olsen (2012). The relevance of doctoral training in different labour markets. *Journal of Education and Work*.
5. Kallave Maheshwar Gangadharrao (2015) Towards improving the quality of research *Abhinav*, Volume No.2, Issue No.6 ISSN 2277-1182, 47-49.
6. Black, T.R. (2000) *Understanding Social Science Research*. Thousand Oaks, CA: Sage Publications.
7. Girden, E.R. (2001). *Evaluating Research Articles: From Start to Finish*. Thousand Oaks, CA: Sage.
8. Stern, P.C. (1979) *Evaluating Social Science Research*. New York: Oxford University Press.
9. *The Hindu*, Oct. 26, 2015.
10. Brew A. and Lucas, L. (2009) *Academic Research and Researchers*. Society for Research in Higher Education / Open University Press
11. Cabral, A.P and Huet, I. (2011) Research in Higher Education: the role of teaching and student learning. *Procedia - Social and Behavioral Sciences*, 29, 91-97. doi:10.1016/j.sbspro.2011.11.211.
12. Cabral, A.P and Huet, I. (2012) Contributions for innovative institutional research quality assessment practices and processes. *Procedia - Social and Behavioral Sciences*, 47, 1109-1114. doi: 10.1016/j.sbspro.2012.06.787
13. Ana Paula Cabral and Isabel Huet (2013) Assessment of research quality in higher education: contribution for an institutional framework 5th World Conference on Educational Sciences-WCES 2013 *Procedia-Social and Behavioral Sciences* 116 (2014) 1528-1532.