

Enriching research in academic institutions

A. Kalanidhi† & K. Manivannan‡

Commonwealth Science and Technology Academy for Research (C-STAR), Chennai, India†
VMKV Engineering College, Salem, India‡

Opening Address

ABSTRACT: The role of research in academic institutions has been emphasised. A new model has been proposed for absorption into the academic world. The Au-Kalanidhi model proposed here has been tested at three universities and hence the robustness of the model works out to be a time-tested model. As research plays an important role in the quality of an institution, it is proposed that an accreditation council be set up to evaluate the standard of research institutions across the globe. Preparatory work on the International Accreditation Council of Research has also been outlined.

INTRODUCTION

The quality of institutions has been dependent on the research activities being carried within. Various research projects conducted by academic agencies have proved the point that the quality of a BTech programme is better in an institution where the institution offers an MTech programme. The quality of both BTech and MTech programmes is better where the institution also offers a PhD programme. Accordingly, research has been emphasised and a new model is also proposed to ensure an increased amount of research activity in the institutions. A tool is needed to identify the progress in research in the institutions. Culmination of this effort is the birth of a new agency known as *International Council of Accreditation for Research*. This accreditation agency is the first of its kind across the globe.

RESEARCH IN ACADEMIC INSTITUTIONS

With its current number of technical institutions, India is rolling out approximately 400,000 engineers per annum. However, in order to meet both the local and global demand Indian engineering and technology education needs to increase this number ten-fold.

Attempts were made to invite private participation in the promotion of technical education in India. The All India Council for Technical Education (AICTE) being the apex body to regulate technical education has given permission for a large number of technical institutions to start up. As usual, because of private participation, private technical institutions blossomed in the southern part of the country. The Central Government granted some of them university status. Some of them in the private sector could not flourish because of the short-sightedness caused by focussing on the generation of wealth rather than the promotion of quality education and research. Such institutions have no vision for growth.

Due to a sudden expansion in the number of technical institutions in the private sector, there has been a huge attrition of academic staff from Grade I institutions. Due to this serious decline in academic strength, research work progress has been severely hampered in Grade I institutions. The academic staff with research experience that moved to Grade II institutions (private sector) were paid substantially better, but these institutions do not have the right environment to promote research.

Private institutions are paying heavily. The salary structure for qualified academics is an inverted cone. While top class institutions pay moderately well, newly started private institutions sometimes pay as much as treble the salary.

The scarcity of academic staff will be much more than what can be foreseen today and in the near future. In the next ten to twelve years, the demand for more engineering institutions and for quality staff will increase many fold.

Any methodology that is being developed should focus on meeting the teaching needs of these institutions and research support for these institutions and also having high class research staff for Grade I and Grade II institutions. The aim has been to bring out quality teachers and researchers to meet the ever increasing demand.

RESEARCH FUNDING FROM THE GOVERNMENTAL AGENCIES

All India Council for Technical Education (AICTE), University Grants Commission (UGC), Department of Science and Technology (DST), Department of Biotechnology (DBT) and other such funding agencies have increased the research funding to both the central and state supported science and technology institutions to promote research in a great way and to offer more fellowships to attract research scientists and engineers to take up research. Through this, it is expected that 25,000 fellowships will meet the needs initially. In subsequent years, there should be a 25% increase in the number of fellowships every year. The fellowship may be Rs. 10,000 per month. Annual research funding for research per scholar may be Rs. 500,000. For Grade I institutions, this grant has been liberally increased many fold. At this rate, the Indian government will be earmarking Rs. 20 billion for the above scheme. This will yield quality research and high quality research papers in the coming years.

This grand support for research funding has been limited to Government-funded Grade I institutions. Of late, private professional institutions (Grade II) have realised the importance of research and have started looking for qualified teachers to promote research and thereby improve the quality of education offered at the undergraduate and graduate levels. They are willing to attract students and staff from outside the country. Many institutions have developed hostels to accommodate international students. In this direction, the Commonwealth Science and Technology Academy for Research (C-STAR) was established as a non-profit organisation, and has embarked on a scheme to attract qualified academic staff to come forward to help these institutions in promoting research.

Organisations engaged in research in the international arena can safely look for research scholars to do research from India. They can also look for the institutions that can provide a platform for doing research. India has a large number of institutions with good library infrastructure. At the moment, around fifty technical institutions with a good research environment are partners in the C-STAR academy.

ACCREDITATION OF RESEARCH

Accreditation of research involves creating a platform for research, creating channels for funding research and creating channels for inviting researchers from the international community to do quality research. Many engineers with a postgraduate degree qualification do not attempt to undertake research. Graduate engineers, who successfully graduate from Grade II institutions, would like to associate themselves with good institutions and, hence, proceed for their master's degree programme, incidentally promoting their job opportunities too. Beyond master's, very few students embark on research. Those who proceed for research do not stay in teaching.

It is a fact that professional institutions with a master's programme are able to roll out better quality undergraduate students. Institutions with PhD programmes roll out better master's and better undergraduate students. With the scarcity of qualified teachers to teach in professional institutions and to carry out research and provide research guidance, there is an urgent need for a new academic model to meet these two requirements in order to achieve higher quality in institutions. A new model (the Au-Kalanidhi Model) has been developed and was implemented at Anna University for promoting research in both Grade I and Grade II institutions. This model has been implemented successfully and effectively at Anna University, the Punjab Technical University, the National Institute of Technology, Warrangal and two more Grade II universities where the expected result with regard to research have emerged.

THE AU-KALANIDHI MODEL

In India, universities have a three tier system of academic staff, visiting professor, reader and lecturer. Lecturer appointments were kept in abeyance. The salary component of these vacancies was utilised to pay fellowships to the research/teaching associates. Vacancies were advertised and MTech/ME graduates were selected and appointed for a period of four years, each with a fellowship of Rs. 8000 - in the first year with an increment of Rs. 500 per annum. A regular lecturer was paid Rs. 12,000 per month and was handling three courses. A teaching/research associate was expected to teach two courses and carry out research during the fellowship period.

Under this system, talented youngsters for the above scheme were attracted. They were informed that the period of fellowship would be treated as equivalent to that of a lecturer for the purpose of appointment as a reader at the university. When they seek an appointment as a reader at the university they are subjected to the normal appointment procedures by the university. However, their scholastic ability for teaching and research is already well known to the university and this information facilitates their appointment as a reader.

Readers were expected to publish research articles in high impact journals every six months. If there is no research progress, the agreement will be terminated. In this system, quality research papers published in high impact journals

were generated. The number of PhDs produced by the university has increased considerably. The university could select the best of the scholars for a further appointment. The system allowed producing qualified teaching personnel with the best-possible university teaching experience for other institutions in the private sector. This scheme had many advantages but also had one limitation: there was limited research funding to carry out experimental research. Here, the organisers were able to mobilise industry support. Each year, ten to twelve industries signed agreements for collaborative research. Thus, the funding received through these agreements has been utilised effectively for offering fellowships and for promoting research.

Since many universities are willing to implement this model, many research fellowships are available in India and this is a boom for international students. International scholars can look for research opportunities in Indian institutions, which is a paradise on earth embedded with rich cultural values and heritage. Ultimately, the aim is to produce quality research scholars with values in life which one can get in India.

In 2001-2002, the number of publications for the University was 309 (International) and 354 (National). After the introduction of this new research model, in 2005-2006, the numbers increased to 574 and 481 respectively. This is purely because of the recruitment of 300 teaching/research associates under the model.

EXAMINATION AND EVALUATION OF RESEARCH

Examination is a mechanism to ensure quality control. Particularly for research scholars, it is important to realise that the examination system is an essential component in evaluating the progress of research. The present examination in research consists of two parts. The first part is an evaluation of the candidates' fundamental knowledge in the chosen field that would allow him/her to proceed with the chosen area of research and the second part is a nesting thesis on the findings for submission to the degree awarding institution. In India, the first part is being done at the postgraduate level.

The syllabus content for the particular candidate will have to be decided by a committee constituted and approved by the university where the candidate is actually doing research. The Research Committee may decide to identify existing courses from the postgraduate courses offered by the university or they may prescribe new courses, the content of which is at the postgraduate level.

The second part deals with the actual research to be carried out by the candidate. After preparing a synopsis for the proposed research and getting it approved by the Research Committee, and then carrying out the research under the strict guidance of the Research Committee, the findings of the research work will have to be submitted in the form of a doctoral thesis. This procedure may vary from university to university and country to country across the Asian region.

Researchers from Asian countries will have plenty of opportunities to participate in the ongoing activities in research both on a short-term and long-term basis. In this big adventure, C-STAR has a major role to play in connecting both ends in order to promote research. Two important components in research are financial support and funding, and library infrastructure. Many engineering institutions are fully geared to support funding for research. They also have state-of-the-art libraries including on-line libraries. All these institutions have broadband internet connectivity.

INTERNATIONAL ACCREDITATION COUNCIL FOR RESEARCH

C-STAR being a non-profit organisation is willing to join the efforts in establishing a *Research Council* to monitor and uphold the standard of research in colleges and universities across Asian countries. Likeminded academic non-profit organisations are needed to promote a research council to take care of quality in research. C-STAR is looking for organisations in the Asian countries to come forward to establish jointly such a Research Council in order to promote research in professional institutions. C-STAR wishes to have the honour of receiving major support from the WIETE. Establishment of the council involves the signing of an accord for the establishment of the council by the participating agencies from a range of countries and drafting guidelines for the accreditation of the research standards of various institutions in the Asian region. It is difficult to compare the quality of research in the academic system without accreditation. Without such a research council in place, it will be difficult to induce a spirit of competition for high quality research. This council will facilitate the mobility of scholars. It is likely that C-STAR will initiate this accreditation council for research for the Asian region and this could probably expand to other countries across the globe later.

CONCLUSION

There is a widely prevalent phenomenon across the academic world that requires having sufficient numbers of qualified academic teachers and quality research. In order to achieve both, an experimental model has been illustrated with facts on the merits and suggestion for establishing an accreditation council to monitor, accredit and uphold high quality research, which will result in the development of the *3i's*: Intelligence, Inventions and Innovations. In other words, the establishment of such a council would promote quality professional institutions and quality applied research resulting in a reduction of the gap between the institution where the inventions and innovations blossom, and industry where the inventions and innovations are converted into products useful to humankind.