



Research in Pakistan: Structure, Funding and Results

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ABSTRACT

In Pakistan Higher Education Commission (HEC) is considered as the centralized body that governs and sets policies for research and development for all educational institutions of higher learning. Availability of research material is one of the main hurdles in the production and creativity of many researchers in all disciplines at university level. Dearth of such facilities demotivates the young researchers, and they start looking for opportunities in the urban countries. HEC has made the first move by starting National Research Program for Universities (NRPU) by promoting the Research & development to meet the current challenges. The aim of this research is to provide the research status in Pakistan, its structure, funding and results. The support of the government to researchers plays a vital role. Some bottlenecks that have been identified are: centralized system, processing delays in approval of funds and projects and slow execution of policies.

The delays in the approval and release of funds affect the system and interest of researchers. Poor check on policy implementation results in economic loss to the country. HEC is trying to encourage research culture in Pakistan; The HEC supports researchers based on their ability and impact factor with a maximum funding of 20 Million. It provides grants for research projects in the fields of Engineering, Science & Technology as well as humanities and social sciences. The objective is to encourage research in all fields and branches of learning.

Index Terms— Funding HEC Literacy rate,NRPU,OSS, PEC, PSPD, Research, Technology.

1. INTRODUCTION

Education sector in Pakistan after being neglected for a long time has now been given higher priority by the government. A total of Rs. 57.4 billion has been allocated for this sector, for the progress and growth of advanced learning and research [1]. HEC is considered as the most esteemed organization and central body of Government of Pakistan which makes educational policies for all public sector universities of Pakistan [2]. The public sector universities are funded by HEC for the developments such as enhancement of labs and libraries and other short and long term projects [4].

The government of Pakistan announced a budget Rs. 57.4 billion for the promotion of advance edification and research. Rs740 million has been allocated to MS and PhD Program of Faculty Development for Engineering Universities. Public Sector Development Program (PSDP) was allocated Rs18.4 billion for the fiscal year 2013-2014. It was 15.8 billion last year. Rs. 39 billion was allocated to enrolment in higher education, an increase by 14%. The funding includes 2000 more scholarships. A scholarship fund of Rs. 1.4 Billion was approved by the Planning Commission of Pakistan, for students under the Overseas Scholarship Scheme(OSS) to pursue graduate and postgraduate studies in foreign countries. Another fund of Rs. 739 Million

was allocated for indigenous PhD fellows, while PhD fellowship program got Rs550 million. Rs130 million is assigned to Pakistani students registered in the agriculture and business administration programs at local universities [11]. The Literacy rate from 1951-2009 is shown in Fig. 1, while in Fig. 2 the total Literacy rate from 1951-2012 is shown. The data source for this graph is [21].

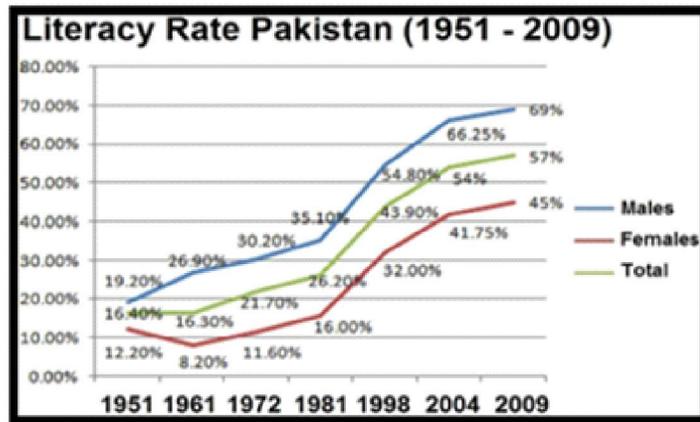


Fig. 1. Literacy rate in Pakistan. Resource: [20]

Literacy Rate in Pakistan (1951-2012)

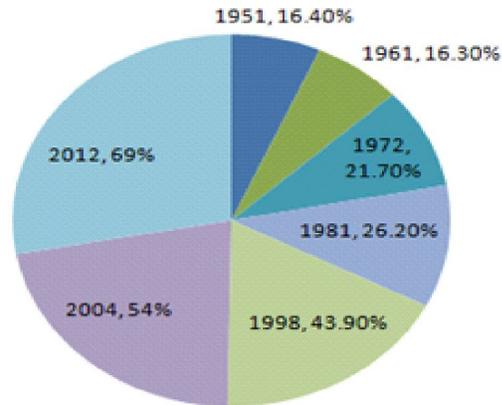


Fig. 2. Literacy rate in Pakistan

The creation of new ideas, innovations and the dissemination of latest information is the main responsibility of higher learning institutions. HEC took the first move to start a research funding program as an incentive to innovative researchers [4]. The research publication has shown an exponential growth in the past few years. The Digital Library program contributed in the acceleration of research output. Researchers now have better opportunities to access digital libraries, e-books and other electronic journals/magazines and web sites thus gaining and sharing more knowledge, with better incentives offered by the HEC [19].

All projects of HEC go through the centralized planning system, as required by the Government of Pakistan. Hence the government is the main player for the development and research in the country. For all long and short term plans, strategic planning is done at national level [3]. To promote scientific research, the awarding criterion for the research grant by HEC is competitive merit. It should be a high level, scientific research, relevant to the national requirement, and be carried out by university teaching faculty.

The HEC provides a grant for a period of one to three years to researchers. The applicant should be a full time faculty member, with an advanced academic degree and related research experience, in a university [5].

Some Pakistani research projects have produced excellent results and the conferences held at universities produce good quality of research papers, but the question is how many academic research results actually make it into industrial practice. Work is being done on academia-industry linkages. The major issues that currently prevent a wider industrial acceptance of research results are:

- i. Insufficient resources and incentives

ii. New start-up companies require high efforts and focus on new technologies/research that does not require large capital.

While most research projects do provide ambitious development plans, these are rarely implemented to a full extent, because the effort for productivity is underestimated and insufficient resources and incentives are available when projects fade out [1].

This paper aims at highlighting the research status in Pakistan, support to researchers by the Government of Pakistan, particularly HEC and Pakistan Engineering Council (PEC). The paper also identifies bottlenecks and issues faced by researchers in Pakistan. The data has been collected from research papers, reports, HEC website and information from websites of Ministry of Education Pakistan.

The rest of the paper is arranged as follows: Section II provide Historical background, while section III outlines the structure, section IV presents funding. This is followed by Impact of Research in Pakistan in section- V and Conclusion in section VI.

2. HISTORICAL BACKGROUND

Availability of higher education to common man is the basis of progress and prosperity for a country. In Pakistan, the overall expense on universities by the beginning of this millennium, had been approximately Rs. 400 Million which was estimated as \$400 per student per year. It was believed that developing countries should focus on primary education; consequently fewer amounts were reserved for higher education and its development. A dramatic change evolved in the last decade and the fund allocation per student per year was raised to \$2000. This fund enhancement assisted HEC to implement its programs of higher education, research & development in Pakistan [9].

Degree awarding institutions and universities were asked to come up with a vision plan for upgrading the research and development in each university. Large amount of funding has been allocated to research and development project [10]. Fig. 3 shows the growth of universities/Degree Awarding Institutes (DAIs) in public and private sector from 1947-2005.

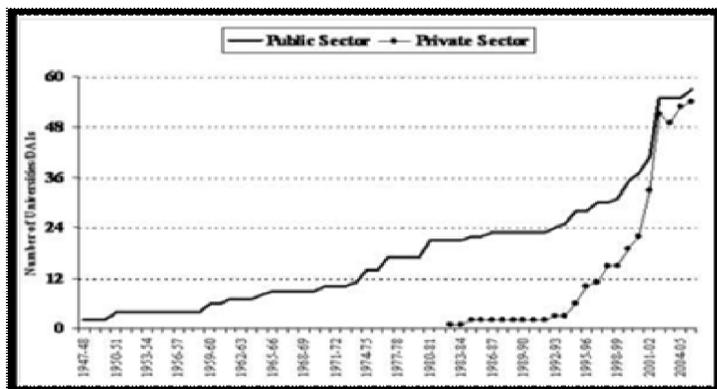


Fig. 3. Rate of Growth of Degree Awarding Institutions & universities in public & private zones (1947-48 to 2004-05). Source, HEC Pakistan [10]

3. STRUCTURE

HEC made the first move to start a research funding plan in which innovative researchers would be rewarded with Financial grants [4]. All projects of HEC go through the centralized planning system, as required by the Government of Pakistan. Hence the government is the main player for the development and research in the country. For all long and short term plans, strategic planning is done at national level [3]. To promote scientific research, the awarding criterion for the research grant by HEC is competitive merit. It should be a high level, scientific research, relevant to the national requirement, and be carried out by university teaching faculty. The grant duration allowed for the research is minimum one and maximum three years. The applicant should be a full time faculty member, with an advanced academic degree and related research experience, in a university [5].

A. APPROVAL & PROCESSING PROCEDURE

For research paper publication, HEC has set procedures which all researchers have to follow. Research proposals and papers are sent to nominated focal points in all disciplines and related fields. They are research experts and amongst the top specialist in their respective areas. The entire research proposals are first sent to these focal points by HEC, where they are evaluated by at least three research experts. Initial screening of the projects is also done at the focal points. If the project is not found suitable for funding it will be rejected or may be returned to HEC for revision by the applicant. The remarks of these experts at the focal points and reviewers are taken as the last verdict. This whole process may take 3 to 6 months [5].

B. CATEGORIZATION OF RESEARCH

The research is categorized as follows [5]:

- Basic research
- Applied research
- Community/social research
- Thematic research
- Commercialized/industrial research.

C. RESEARCH AREAS

HEC requires the research proposal to be in following fields of studies; Social Sciences, Management Sciences, Humanities, Basic Sciences, Natural Sciences, Medical Sciences, Engineering & Technology and Agricultural Sciences[5].

4. RESEARCH FUNDING

The new ideas and innovative project proposals that come from researchers, faculty and students, differentiates higher learning institutions from others. The HEC provide funding to students and researchers in higher education institutions to validate their research proposal with experiments, using lab

equipments, and library resources to help them in getting information about the proposed task. It also provide financial support for participating in conferences and meetings at national and international level [10].

Research grants as provided by HEC (w.e.f. 01-12-2010) are shown in table below:

Table-1 For Physics, Chemistry and Biology [7]

Impact Factor	Eligible Amount (million)
100 or above	20
50 -99	17
20 -49	15
10 -19	12
0 -9	10

Table-2 For Remaining Disciplines [7]

Impact Factor	Eligible Amount (million)
50 or above	20
25 -49	17
10 -24	15
5 -9	12
0-4	10

In addition to the above support HEC also provides Outstanding Research Awards in recognition of the achievements of Pakistani researchers for outstanding innovation and publication in their specialization fields. It provides full support to higher education institutions meeting the standards and challenges and thus contributes to the economic development of the country [7].

The research funding amount is likely to increase as new projects and industry-academia linkages are being surveyed. Analysis has shown that the applications for research funding have grown exponentially. Compared with the pre-HEC era,

the research award grants have also shown an exponential growth. The funds assigned to this area have gone over Rs. 300 million per year and the request per month continues to increase [10].

5. IMPACT OF RESEARCH IN PAKISTAN

Research and development in Pakistan has shown dramatic changes ever since HEC was created. It has shown very encouraging effects on education system of universities, higher education institutions and research in the country. HEC has set up one of the best Digital Library in Pakistan giving access to 45,000 textbooks research monographs from 220 international publishers as well as to 25,000 international research journals [12], [13]. The number of enrolments in the university grew from 135,000 in 2003 to 400,000 in the year 2008, almost tripled [14].

The promotion of research in the universities and higher education sectors resulted in vast increase of international research publications in Pakistan. The number grew from 600 research papers per year in 2003 to 4300 in 2008. During the period from 1947-2003, there was not a single Pakistani university that appeared in the ranking list of top 600 universities in the world. At present two Pakistani universities appear in the top 200 World's Technology Universities [15], [16]. During the period 2003-2008, Developments in the education sector produced 51 new universities and degree awarding institutes and 18 new campuses of the existing universities [17]. Asia according to the UK-based Quacquarelli Symonds (QS) World University Rankings 2013, seven Pakistani universities were placed among the top 250 Asian universities [18]. The impact of the HEC on quality research publications generated from Pakistan is shown in Fig. 4.

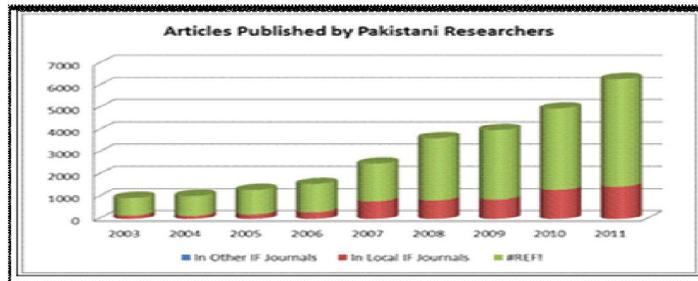


Fig. 4: Impact of the HEC on quality research publications originating from Pakistan [13].

The pre-HEC and post-HEC research statistics is shown in Fig. 5. This success is clearly a result of the radical changes initiated by the HEC for higher education and research. There has been a 50% increase in the research publication in the past two years, from 3,939 to 6200 which led Pakistan to compete in the world ranking [18].

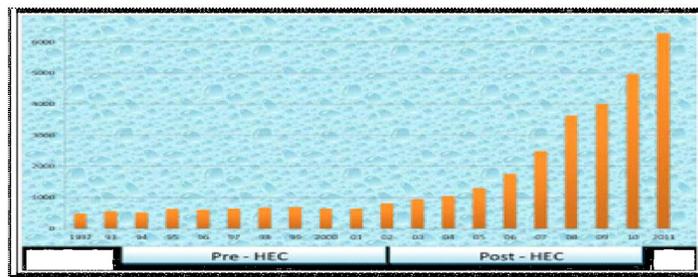


Fig. 5: Total publications in Pakistan (1992-2011) [13]

6. CONCLUSION

This paper provides a survey of the existing status of research in Pakistan and initiatives taken by the Government to give a boost to research activities and its impact on the output of research; Due to the initiatives taken by the government the higher education sector in Pakistan has begun its expedition towards a successful accomplishment[19].

Education sector in Pakistan after being neglected for a long time has now been given higher priority by the government. A total of Rs. 57.4 billion has been allocated for this sector, for development of higher education and research. Research and development in Pakistan has shown dramatic changes ever since HEC was created. It had a very positive impact on higher education and research in the country. There has been a 50% increase in the research publication from 3,939 to 6200 in just two years which led Pakistan to compete in the world ranking. Today Pakistani researchers are contributing more research papers, than our neighbor country India. The increase is second highest worldwide. In the last two years there has been a 50% increase in PhD faculty in the public sector universities from 4,203-6,067[18].

This success is clearly a result of the revolutionary changes initiated by the HEC and the devotion, dedication and hard work of the faculty and researchers of higher education institutions. This has also improved the quality of teaching and learning at universities and higher education institutions and Pakistan can now compete as a world player in research and higher education [18]. The objective of this study was achieved, through a thorough review of reports, documents and websites of Ministry of Education and the Higher Education Commission (HEC) Pakistan.

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