

UNDERGRADUATE RESEARCH CURRICULUM FRAMEWORK: HOW WILL IT HELP IN HIGHER EDUCATION

H Akther Banu

Assistant Professor, Department of English, Silver Jubilee Govt College(Autonomous) Kumool

All good ideas and measures are nothing without implementation.

- Mahatma Gandhi

Gurnal Myrdal rightly pointed out that, “Education has an independent as well as instrumental value, i.e., the purpose of education must be to rationalize attitudes as well as to impart knowledge and skills. Education for national development should aim at training the young generation the life skills, self-reliance, personality development, community service, social integration, and political understanding.”

The highlight of Undergraduate Research Curriculum Framework is student centricity. Till now, in the higher education framework, while structuring the curriculum framework, not much attention was given to the special situation or needs of the students. National Educational Policy (NEP) will lead to some significant changes in the educational sector. Some of the changes will unanimously be accepted, while some may have problems being implemented due to inherited cultural issues. It would not be wrong to say that the positives supersede its negatives, and so we may look forward to the future with the hope of better education in the years to come. In one of the most exciting aspects for students, the NEP will provide students with greater freedom in choosing their subjects. The rigid boundaries between Arts and Sciences, curricular and extra-curricular subjects or vocational and academic streams have been removed. It aims to give equal importance to all subjects alike. To achieve the goals the government should work on

Proceedings of D.H.E. Haryana approved National Seminar on Quality Initiatives in Higher Education improving the basic infrastructure that will support the digital infrastructure in all areas.

WHY IS UNDERGRADUATE RESEARCH IMPORTANT?

Undergraduate research is a learning activity that enriches a student's undergraduate experience. Students report that participation in research, scholarship, or creative activity broadens and deepens their classroom learning and supports the development of a range of skills. Undergraduate research is the exploration of a specific topic within a field by an undergraduate student that makes an original contribution to the discipline. It is a fairly recent concept in the academic community, with roots in the nineteenth and twentieth centuries. Developing and maintaining undergraduate research programs benefits students, faculty mentors, and the university. Incorporating a research component along with a sound academic foundation enables students to develop independent critical thinking skills along with oral and written communication skills.

The Undergraduate Research Programmes (URP) encourage the students to experience the joy of research and what it means to be a researcher. Undergraduate research is the exploration of a specific topic within a field by an undergraduate student that makes an original contribution to the discipline. URP works to expand research opportunities for undergraduate students to deeply explore issues or ideas by either working on them independently under the supervision of a faculty member or with faculty in their laboratory or on their research projects and is good preparation for graduation and provides exposure to a research-oriented career in future. Students respond to announcements by faculty who may be looking for students for their research projects. Students are also encouraged to directly approach the faculty and express their desire to work with them on research projects.

HIGHER EDUCATION AND RESEARCH IN INDIA

Of India's 1.3-billion population, there were only 216 researchers per million population in 2015. India's investment in research is a measly 0.62 percent of GDP. These numbers are well below global best practices. France, for example, spends 2.25 percent of its GDP on research, and the United States, 2.74 percent; both countries have some 4,300 researchers per million

population. China, for its part, invests more than 2.11 percent of its GDP on research and has 1,200 researchers per million population. In higher education, in particular, India's research expenditure is only 4 percent of GDP. There are some 161,412 students enrolled in PhD programmes in 2018. This comprises less than 0.5 percent of the total student enrollment in higher education in the country – which constitutes students enrolled in universities, colleges and standalone institutes pursuing undergraduate and postgraduate programmes.

In March 2018, in the annual budget, Finance Minister announced the 'Prime Ministers Research Fellowship', with an initial budget allocation of INR 16.5 billion. Under the scheme, undergraduate and postgraduate students with a Cumulative Grade Point Average (CGPA) of at least 8.0 from elite Indian institutes such as the Indian Institute of Science (IISc), Indian Institutes of Technology (IITs), National Institutes of Technology (NITs), Indian Institutes of Science Education and Research (IISERs) and Indian Institutes of Information Technology (IIITs), will be eligible for direct admission in PhD programmes of IITs and IISc. They will also be fairly compensated under the scheme. While it may be too early to judge the implications of such measures, the question that must be asked is whether the research crisis in the country is only about the scarcity of compensation or funds for scholars. Moreover, it needs to be examined why the schemes are restricted to a select few elite institutes that constitute only two percent of student enrolment in higher education.

WHY INTEGRATE UNDERGRADUATE RESEARCH?

The existing curriculum does not do much to pick students' curiosity. There is a need to integrate undergraduate research into the learning process. In most existing undergraduate curricula in India, education is synonymous with learning. The test of your success as a student is how well you consume knowledge. The exam is where you prove how well you did that.

INDIAN INSTITUTE OF SCIENCE, BANGALORE:

An undergraduate programme in Science for students after Class XII was conceived during the Centenary Celebrations in 2009. The first batch of students was admitted in 2011. The program offers a four-year Bachelor of Science (Research) and a five-year integrated Master of Science course in

six disciplines: Biology, Chemistry, Environmental Science, Material Science, Mathematics, and Physics. The course aims at exposing the students to the inter-disciplinary nature in which scientific research is done in many upcoming fields. The Indian Institute of Science collaborates with various government organisations like the [Indian Ordnance Factories, DRDO](#), the [ISRO](#), [Bharat Electronics Limited](#), [Aeronautical Development Agency](#), [National Aerospace Laboratories](#), [CSIR](#), Department of IT ([Government of India](#)), [Centre for Development of Advanced Computing](#), etc. IISc also works in collaboration with private industry and research labs. In March 2016, a science start-up, incubated at the IISc, built the world's first food-grade DNA/RNA stain. This might cut the time taken to diagnose conditions such as HIV to a day, from 45 days at present. IISc was also ranked first in India in the newly introduced research category for 2021.

Chandan Das Gupta, dean, UG programme, IISc. described, "The programme is different from the standard BSc programmes available as you will usually find only three-year BSc plus two-year MSc for pure science subjects. The objective is to teach students in an atmosphere of research. The faculty will be academicians who are engaged in research. It is designed in such a way that it is interdisciplinary. The programme is offered in six major disciplines — physics, chemistry, maths, biology, materials and environmental science. It is also mandatory to study a minimum number of courses in engineering and humanities. Students, at the end of the course, will have a foundation in all the subjects... Science education in India has many problems. There's a lot of interest but not enough opportunities. So we are trying to start a new trend. The bunch of young bright students will be stimulating for the others in the campus that is known for its research activities."

HINDU COLLEGE, NEW DELHI:

The Hindu College in Delhi has taken an innovative measure long overdue in the landscape of Indian higher education. An interdisciplinary centre for undergraduate research is coming up on its premises, where research in the natural and the applied sciences — physics, chemistry, botany, zoology, computer science, math and statistics will be carried on, along with language and media studies labs, which will also work closely with the social sciences. In the knowledge era a system of education where research

becomes integral to undergraduate education. We have to accept the need for undergraduate research to increase student curiosity and questioning capacities not addressed by the existing curriculum. But the consumption of knowledge is only a part of the story of education. The other part is the production of knowledge. The large trajectory of higher education in any subject is essentially about the gradual shift from the mode of consumption to that of production — from being a *consumer* of knowledge, a student, to being a *producer* of new knowledge through original research.

The stark division between the consumption and the production of knowledge is reflected in the way institutions are structured in India. Research institutes are devoted to the creation of new knowledge, mostly in the natural and the social sciences. The university, on the other hand, has rarely been a venue of significant research, despite a few notable exceptions. For the most part, fundamental research has been concentrated in research institutes such as high-powered social science centres such as the Centre for the Study of Developing Societies (CSDS), Centre for Studies in Social Sciences, Calcutta (CSSSC), Centre for Women's Development Studies (CWDS), Tata Institute of Social Sciences (TISS), along with scientific institutes such as Indian Statistical Institute (ISI), Indian Institute of Science (IIS), and Tata Institute of Fundamental Research (TIFR). These institutions have little, if any, relation with undergraduate education, though some of them are venues for doctoral and postdoctoral research. We have started to see some happy exceptions to this trend in recent times, at least in the sciences — institutions like the Chennai Mathematical Institute (CMI) and the appropriately titled Indian Institute of Science Education and Research (IISER), which has seven locations nationwide: Berhampur, Bhopal, Kolkata, Mohali, Pune, Thiruvananthapuram and Tirupathi. All of these institutes have undergraduate as well as graduate programmes, often integrated. Such developments come as radically innovative in an educational landscape where colleges have traditionally been imagined as places where students learn, that is, consume existing knowledge; naturally they have no place in institutes where advanced professionals produce new knowledge.

SHIV NADAR UNIVERSITY, CHENNAI:

The Undergraduate Major in History at SNU provides students with a basic

grounding in history and archaeology, with the development of skills in research, analysis and quantitative reasoning that are essential to a thorough grounding in the liberal arts. BA Research degree programme is fully integrated into the culture of research and training at Shiv Nadar University. Students at the University benefit from a choice-based credit system.

Students enrolled for a BA Research degree in History benefit from the extra-curricular provisions of research and training available to all students at the university. Beyond the formal requirements of the classroom, students may opt for a supervised research project under the direction of a faculty advisor under the Opportunities for Undergraduate Research (OUR) scheme.

Top institutes of India in the field of Science and Technology like The National Academy of Sciences, Prayag, Indian Academy of Sciences, Bengaluru and Indian National Science Academy, New Delhi notifies regularly Summer Research Fellowship Programme for students and teachers in India. Summer Research Fellowship programmes by these institutions are offered under the guidance of professors of different renowned universities, in their respective areas of interest.

RESEARCH OPPORTUNITIES FOR STUDENTS IN INDIA

1. DAAD Wise Internship.
2. Vienna Biocenter Summer School Internship.
3. MitacsGlobalink Research Internship.
4. SN Bose Scholarship.
5. Khorana Scholars Program.
6. Charpak Lab Scholarship.
7. Students Undergraduate Research Graduate Excellence Program (SURGE)
8. IUSSTF-Viterbi Program.

ROLE OF NATIONAL RESEARCH FOUNDATION

A new National Research Foundation will be set up through an Act of Parliament, as an autonomous body of the Government of India, to fund, mentor, incentivise, and build capacity for quality research across the country in all disciplines, primarily at universities and colleges, both public

Proceedings of D.H.E. Haryana approved National Seminar on Quality Initiatives in Higher Education and private. Appropriate infrastructure and trained staff will be provided to enable it to fulfil its mission.

The NRF will competitively fund research in all disciplines across the academic landscape - from subjects such as Medicine, Physics, Agriculture, Artificial Intelligence, and Nanoscience to Education, Sociology, Archaeology, Art History, and Literature. The NRF may on occasion identify areas of research that are of special importance to the country and prioritise funding to them, but it will consider and fund outstanding proposals in all areas. The NRF will not directly fund defence-related or other sensitive strategic research.

HIGHER EDUCATION AND RESEARCH IN ANDHRA PRADESH

In [Andhra Pradesh](#), there are twenty-two state universities, three central universities and twenty Central Autonomous Institutions, four deemed to be universities and 5 private universities. Out of 104 autonomous degree colleges in the state, there are 16 government autonomous degree colleges and 25 private aided autonomous degree colleges and the remaining are in the engineering stream and are performing well under autonomy. Autonomous colleges have more academic and operative freedom than non-autonomous colleges. They have the freedom to frame their curriculum, devise methods of evaluation in consultation with parent affiliating universities. At present, there are about 1000 private unaided colleges. Andhra Pradesh state is in the frontline for innovations in higher education.

SUMMING UP

The Indian education system must explore ways by which it can upgrade its current, textbook-heavy learning system. Introducing UG research in institutes will not only enhance the quality of students and faculty in the system but also help India generate relevant scholarly research that will contribute to the country and beyond.

In higher education, past efforts have been modest and fragmented, and have failed to impact the education system in any significant way. The state of research, in particular, has not only failed to improve but has suffered tremendously—and the blame can be placed on both the government and the educators themselves. Owing to the segregation of teaching and research in the country, entire generations of students have graduated from the

university system without producing even single original research. Many of these graduates lack the skills required to be employable as well as knowledge of the industry they were to work in.

- ❖ The National Education Policy 2020 is aimed at transforming India's education system into a modern, progressive and equitable one.
- ❖ NEP 2020 focuses on reducing the curriculum content to make space for critical thinking and in turn, develop individuals with 21st-century skills instilled in them. Hence, all aspects of the curriculum and pedagogy need to be restructured to attain these goals.
- ❖ The challenges in successfully implementing these changes include modifying the curriculum following the National Curriculum Framework. Also, educators need to rethink the learning content rubric and modify the textbooks accordingly.
- ❖ The NEP focuses on formative assessment for learning rather than summative assessment. The primary purpose of changing the assessment system is to promote continuous tracking of learning outcomes.
- ❖ Furthermore, the focus from teacher-centred learning to student-centred learning to foster collaborative skills, critical thinking, problem-solving and decision-making abilities in the youth.
- ❖ Continuous assessment requires faculty to use innovative evaluation approaches and assignments. These approaches demand technological intervention and the active involvement of teachers and students. Deploying a continuous assessment framework is a challenging task
- ❖ To deliver the curriculum effectively, colleges and concerned authorities need to train teachers and understand the pedagogical needs to make a smooth transition to the new education system.
- ❖ Of India's 1.3-billion population, there were only 216 researchers per million population in 2015. India's investment in research is a measly 0.62 percent of GDP. These numbers are well below global best practices.

We may conclude the NEP 2020 emphasizes making the education system holistic, flexible and aligned to the needs of 21st-century education.

However, to accomplish all these goals, we must overcome all the execution challenges in a sustained manner for years to come.

National Education Policy 2020 envisions an India-centric education system that contributes directly to transforming our nation sustainably into an equitable and vibrant knowledge society by providing high-quality education to all.

- The Vision of the National Education Policy

WORKS CITED

1. Aspiring Minds 2018,
<http://research.aspiringminds.com/category/machine-learning/>
2. Anurag K Agarwal, “Plagiarism, UGC & Higher Education”, Daily News & Analysis, April 9, 2018.
3. National Research Foundation, <https://www.psa.gov.in/nrf>
4. Commissionerate of Collegiate Education, <http://apcce.gov.in/>
5. AISHE, 2018, <https://www.education.gov.in/>
6. Antara Sengupta, “Improving Research in India: Introducing Undergraduate Research in Higher Education” ORF Issue Brief, Issue No. 277, February 2019. <https://www.orfonline.org/>