



Miranda House

UNIVERSITY OF DELHI

RISE

RESEARCH, INNOVATION AND SKILL ENHANCEMENT: Research and Innovation for academic excellence and employability

Objective of the Practice

Miranda House (MH) is committed to providing a stimulating and active learning environment for all stakeholders with a vision to instil **rigour** and **capacity development**. Going beyond regular teaching-learning initiatives in the classroom, **it aims to provide unbridled opportunities for research at the undergraduate level** to foster a culture of inquiry, discovery, innovation, entrepreneurship and student excellence. **Multidisciplinary/Interdisciplinary research** with inclusive participation of sciences and humanities aligns with national goals. The college strengthens **research infrastructure and instrumentation facilities** for inspiring students and faculty to embark on **collaborative and individual** research. It motivates students to **pursue careers** in research.

The Context

Undergraduate students have untapped potential for innovation and research. The National Education Policy (NEP) 2020 promotes undergraduate research in its curriculum framework. GoI has invested in higher education and learning, scientific infrastructure and world-class research programmes. Research and Development goals of the country require nurturing and training of young minds through meaningful interventions. The National Institutional Ranking Framework (NIRF) has also highlighted research and professional practices as one of the five parameters of academic excellence. The college has a legacy of innovative research practices which was strengthened in its pursuit of maintaining the academic standards promoted by NIRF and NAAC. An enriching UG research experience via project-based learning provides the platform for the students to connect the world of textbook knowledge to experiential learning. Most institutions of higher learning, research organisations and employers look for evidence of such creative engagement in the student's portfolio of achievements. Students gain through



Miranda House

UNIVERSITY OF DELHI

early association with faculty members on collaborative research, and participation in research seminars, conferences, and opportunities to publish.

The Practice

1. Since 1984, MH has been a pioneer in the field of UG research through a Programme for Promotion of Scientific Interest in Youth supported by the DST Govt. of India. This laid the foundation for establishment of the prestigious **D. S. Kothari Centre (DSKC)** for Research and Innovation in Science Education. An important stated objective of DSKC has always been to engage UG students in research. This led to the enhancement of the basic infrastructure and procuring equipment for establishing **(i) Research Laboratories; (ii) Laboratories for Advanced Experiments; and (iii) Project-based Learning Studios and Laboratories.**
2. DSKC and its vibrant research and outreach activities positively changed the ethos of the college, impacting departments of science and humanities alike. The flagship programme of DSKC, is a 6 - week summer programme - **“Flavour of Research. Learning in Multidisciplinary Contexts”**. It attracts a large number of students from across the country. Students work in **teams** following their research interests under the supervision of faculty mentors. **Academic and skill enhancement exercises, hands-on workshop training, product development, and lectures** by externals are regularly conducted. Students display their research outcomes through **poster presentations** that are evaluated and recognised by external subject experts.
3. Promotion and training in research have helped students garner positions in **the Summer Research Fellowship Programmes** of prestigious institutions. A large number of students are also recipients of **DST INSPIRE Fellowship**.
4. The **Multidisciplinary Research Centre (MRC)** in MH is an ecosystem that promotes growth through research, innovation and application of science and technology. The research facilities for sciences and humanities are co-located in the MRC. It has also



Miranda House UNIVERSITY OF DELHI

given an impetus to ongoing research by way of adding advanced instrumentation facilities in its 6 new labs.

5. Other multidisciplinary research initiatives include **Policy Centre and Gender Lab (PCGL)**, **Centre for Environmental Studies and Disaster Management (CESDM)**, **North-eastern Regional Research and Resource Centre (NERRRC)**, and **QuarkNet Nodal Centre** which are adding essence to the flourishing research activities in the college.
6. These multidisciplinary initiatives provide a platform for collaborative research work between faculty and students that encourages students, to cross over to the professional world. This creates internship and employment opportunities.
7. Linkages with the industry and incubation centres focus on the enhancement of translational research in the college. The environmental monitoring sensors developed in the MRC are at the final stage of product development with the industry.
8. Disciplines in Humanities and Social Sciences like Political Science, History, Geography, Economics and English encourage research and writing in multidisciplinary fields. The **Multidisciplinary Innovation Projects of DU** and **Star Innovation projects** have strengthened collaborative research between students and faculty, and inculcated innovative thinking and solutions.

Evidence of Success

In the last five years these efforts have culminated in crucial research outcomes providing evidence of success:

1. The DBT Star status of the college enabled upgradation of a variety of instruments in Undergraduate laboratories as well as in centralized research facilities.
2. With the completion of the construction of the **new Academic Block** in 2019, 09 ICT-enabled state-of-the-art undergraduate research laboratories were added. This new block provided space for setting up the **MRC** with **50 new instruments** enabling cutting-edge research.



Miranda House UNIVERSITY OF DELHI

3. At present, **11 PhD research scholars** are working at MRC under the supervision of MH faculty.
4. There is **01 patent granted and 07 published**.
5. These research engagements have helped us achieve **450 research publications in Scopus indexed journals, the college has h-index of 36, 6714 citations**.
6. There are **03 DU Star Innovation Projects and 11 DU Multidisciplinary Innovation Projects** that were sanctioned in the year 2015-16. The work, however, continued till late 2016 providing opportunities for students and teachers to collaborate further for research. In 2020, faculty and undergraduate students contributed to an edited volume "*Waters*" of *Western Rajasthan: Myths, Traditions, Life and Livelihoods*, which emerged out of one of the innovation projects. Manjari Singh, an undergraduate student involved in one of the projects published a book titled, *Chhutki and Cheero* in 2019 emerging out of another innovation project.
7. The evidence of this best practice of the college is recognised by the **Ministry of Education, Government of India** by bestowing the college with **NIRF Rank-1 College** for 6 consecutive years from 2017 to 2022, with **research and professional practice** being its main strength.

Problems encountered, and Resources required

1. Existing infrastructural facilities have given a head start to research by the faculty and they have used initial work as the basis for setting up research in frontier areas, with the award of substantial grants from funding agencies. These facilities need to be strengthened and maintained.
2. There is a major gap between research and development of technology within industries. Thus, it has become the need-of-the-hour to collaborate with the industry and set up a Technology business incubator which will act as an ecosystem to promote



Miranda House

UNIVERSITY OF DELHI

growth through scientific research, innovation, product development and application of technology, while also providing a mechanism for technology transfer and patents.

3. Skill Development and Add-on Courses are needed to enrich learning and introduce students to the frontiers of knowledge and application. These courses require additional funds, laboratories and infrastructural facilities.
4. The college has strong linkages with highly acclaimed national and international organizations and institutions across all fields. This should be further strengthened by increasing the bilateral/multilateral exchange program in the college.

Future Plans

1. To develop its **entrepreneurship cum skill development cell**, where hands-on experience through short-term certification programs will be given to students of undergraduation and postgraduation.
 2. To offer courses in research methodology.
 3. To collaborate with premier national and international organisations for student internships and employment opportunities.
 4. To expand the research initiatives of PCGL with augmented resources contributing to policy intervention at national level.
 5. To set up business incubators and start-ups which will promote growth through scientific research, innovation, product development and application of technology.
 6. To launch peer-reviewed Scopus-indexed research journals providing platform for faculty as well as students' publications.
 7. To ensure optimal utilization of the grants received by the college to set up North-East Regional Research And Resource Centre by developing an innovative incubation lab, start-ups, and media centres with a focus on the North-Eastern states promoting the idea of '**Ek Bharat Shreshtha Bharat**'.
-